

## 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



# When your stress becomes my stress

## Editorial

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Dear readers,

It is a pleasure to welcome you to our newest issue of the Mammoth Magazine about the stress of others and how it can affect our own stress. The idea to do an issue on this topic has been on our minds for quite some time. However, when the pandemic arrived, we thought it was even more relevant to address this topic.

Most of the issues we have done so far have been about the individual, have insisted that stress is a matter of interpretation and therefore, that there are important individual differences. What is stressful for one person is not necessarily stressful for another. However, although we all react differently to the same situation, the fact remains that we are constantly evolving alongside others. So, can my perception of a situation, and therefore my stress levels, be tainted by the fact that others around me are stressed?

Since the beginning of the pandemic, we have been trying by all means necessary to maintain a certain level of social support with our loved ones by abusing the phone, texting, Zoom and everything else

that technology has to offer. However, sometimes an exchange with a loved one leaves us with a strange feeling: an accelerated heart rate, stomach ache, irritability. That call was supposed to revitalize me and instead, I feel worse than before the call started. Why? Simply because we are not resistant to the stress of others.

Therefore, this 23<sup>rd</sup> issue of the Mammoth Magazine will deal with different aspects related to this subject. First, Alexandra Brouillard and Lisa-Marie Davignon interviewed Dr. Pascale Brillon, an eminent clinician and researcher interested in compassion fatigue and vicarious trauma. This article gives us insight into Dr. Brillon's fascinating background, teaches us about what leads to the development of these phenomena and gives us solutions on how to deal with them. To echo the themes of compassion fatigue and vicarious trauma discussed in Dr. Brillon's profile, Sandrine Charbonneau and Myriam Beaudin interviewed two healthcare professionals to get their perspective on their work and psychological well-being during the pandemic.

Dr. Sonia Lupien, director of the Centre for Studies on Human Stress, wrote the third article on the phenomenon of stress resonance and laboratory studies that have been done to document this fascinating domain of research. Audrey-Ann Journault follows with an article on children and how they are sensitive to the stress of significant adults in their lives, including both parents and teachers. Next, Alexe Bilodeau-Houle, Valérie Bouchard and Myriam Beaudin discuss fear transmission within the family environment. Sandrine Charbonneau adds to the present issue by discussing the importance of peers among adolescents. You will surely understand why an anxious young person often befriends other young people similar to them. In

the following article, Rebecca Cernik writes about the sneaky side of some friendships by explaining the phenomenon of co-rumination. If you recognize yourself in this, please do not call your friend to co-ruminate! Finally, Maryse Arcand and Yasmine Zerroug compiled a list of resources for further information or to get help. There is something for everyone, both for the general public and helping professionals. Do not hesitate to consult them!

Happy reading! 🐘

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## Profile of a researcher-clinician: Pascale Brillon

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**Lisa-Marie Davignon**, *doctoral student in psychology, University of Quebec in Montreal*



### (Over) feeling the stress of others

Feeling the stress of others is a common phenomenon that we experience daily in simple situations, such as watching a friend give a presentation that they were dreading. We may feel sweaty or dizzy, yet we are sitting comfortably watching the presentation. Fortunately, at the end of the presentation, our friend feels better and so do we. However, some ways of experiencing the stress of others are more complex and have more persistent effects. Dr. Pascale Brillon, psychologist and professor at the University of Quebec in Montreal (UQAM), focuses on two phenomena related to the stress of others: compassion fatigue and vicarious trauma.

**Compassion fatigue** is a state of exhaustion that can affect a professional who is continually exposed to intense levels of suffering in their clients. Clinicians become disproportionately affected by the painful experiences of others, which is usually followed by a feeling of weariness, emotional disinvestment, questioning one's vocation and an inability to help. **Vicarious trauma** manifests in professionals who frequently hear graphic descriptions of traumatic stories. The affected person will show symptoms of trauma, such as reliving, constant alertness or avoidance.

Although these two themes have mainly been studied in healthcare professionals, Dr. Brillon highlights that they can affect

any "helper", being anyone who provides psychological support to others. Therefore, we sat down with Dr. Brillon to discuss these topics of great interest.

### Academic and professional background: Why work on compassion fatigue and vicarious trauma?

Within the context of her master's degree in psychology at the University of Montreal, Dr. Brillon first worked on self-esteem and self-confidence. She then pursued doctoral studies in psychology at UQAM, where she became interested in a psychopathology that was then included in the family of anxiety disorders and that was very little



known: post-traumatic stress disorder (PTSD). More specifically, her doctoral research focused on women victims of sexual assault and their psychological consequences. Within the context of her thesis, she had the opportunity to follow 35 victims to study the development of post-traumatic consequences and the factors predicting the development of PTSD. She was particularly interested in the interpretation mechanisms of the traumatic event, i.e., perception of the causes of the event and the fundamental beliefs that were shattered. After completing her doctorate on the subject, Dr. Brillon developed a passion for the treatment of PTSD, which motivated her to open her private practice and develop a specialty in the treatment of PTSD. She has also worked at the Anxiety Disorders Clinic at the Montreal Sacred Heart Hospital and began giving training courses to the Canadian Armed Forces to address post-traumatic symptoms. She is also the author of two books on PTSD that aim to help therapists and the general public.

Having built her expertise in the domain of traumatic events, Dr. Brillon has

accumulated many testimonies of people who have tragically lost a loved one (e.g., death by suicide, murder). These people reported that they did not recognize themselves in the "typical" symptoms of grief, focusing solely on reactions of sadness. In fact, they also presented post-traumatic symptoms such as reliving the scene ("flashbacks") or avoiding elements associated with the death. Thus, traumatic bereavement became a significant clinical interest for Dr. Brillon: she wrote the book entitled *Quand la mort devient traumatique* (title translates to *When death becomes traumatic*) and developed a training course for clinicians.

Over the years as a psychologist, various helping professionals approached Dr. Brillon to confess that they felt worn out, exhausted and questioned their ability to practice their profession. These colleagues had given several years of their lives to the helping profession and were thinking of leaving the job that once nourished them. This observation deeply affected Dr. Brillon: "It is no small thing to mourn a vocation" she says. She also points out that as a society, we

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Dr. Pascale Brillon, psychologist and professor at UQAM

cannot afford to lose these mental health experts, especially in the current context of the pandemic. As a result, Dr. Brillon looked into the issue to help her colleagues who were experiencing compassion fatigue. This led her to develop a training course to try to prevent vicarious trauma and compassion fatigue, as well as to write her latest book entitled *Entretenir ma vitalité d'aidant* (title translates to *Maintaining my vitality as a caregiver*), which is the first book on compassion fatigue in French.

As the director of the Trauma and Resilience Laboratory, Dr. Brillon is currently leading a research project to study vicarious trauma and compassion fatigue in humanitarian workers. As her parents were international aid workers themselves, she is aware of the self-sacrifice that accompanies these professions. Not to mention the fact that these workers often find themselves in challenging conditions in remote areas. As a result, the project from Dr. Brillon's laboratory and undertaken by her student Michelle Dewar investigated the psychological state of more than 250 humanitarian workers worldwide to identify the determinants. Analysis of the results is currently underway. Furthermore, with Drs. Frédéric Philippe and Allison Paradis of UQAM, Dr. Brillon also conducted a recent study on the psychological impact of the COVID-19 pandemic on psychosocial workers (article currently submitted for publication).



The results show that mental health workers felt lonelier than the general population during the pandemic. In addition, working in large cities (high-risk areas) amplifies symptoms of emotional distress, which may promote the development of compassion fatigue.

Dr. Brillon specifies that compassion fatigue and vicarious trauma are emerging areas of interest: “there is still a lot of work to be done!” she says. With still so much to be discovered about these phenomena, she says that it would be particularly relevant to develop valid and precise instruments to facilitate screening and examine underlying neural mechanisms. For her part, the professor wishes to clarify the emotional and cognitive mechanisms (emotions such as shame and guilt and the causal attributions of the events experienced) concerning moral injuries. She would also like to study the use of self-care in healthcare professionals (particularly in mental health professionals) and see if it is associated with psychological distress, caregiver vitality and post-traumatic growth (i.e., positive psychological consequences after experiencing adversity).

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### How does it develop?

Dr. Brillon describes five ways in which compassion fatigue and vicarious trauma can occur in caregivers. The first is related to **emotional overload**. Indeed, there seems to be a state of synchronicity between the caregiver and the client: studies suggest that caregivers tend to mimic the client's physical (posture, facial expressions)

and emotional states. This synchrony and the difficulty of maintaining a healthy empathetic relationship can lead caregivers to become overwhelmed by the other's experience. The second explanatory model resides in **fear-related associations**. By continually hearing fear-related traumatic stories, caregivers may come to associate elements of the stories (e.g., objects, words, places) with the fear communicated by the client. These previously meaningless elements may thus become aversive to the caregiver as well. Another explanation is that the caregiver's **beliefs are put into question**. By listening to traumatic stories, this occurs when the caregiver sees a discrepancy between what they believe and the reality that their clients expose them to. In this way, the belief in the inherently good nature of humans may be undermined when the caregiver is repeatedly told horrific stories, notably about assaults carried out by humans. This may make them more vulnerable to compassion fatigue and vicarious trauma. Next, Dr. Brillon describes the **accumulation of risk factors** as a fourth explanatory model. Personal risk (e.g., a low stress management capacity) or work-related factors (e.g., a refractory or hostile clientele) can accumulate and make the caregiver vulnerable. Finally, the last explanation is the **non-implementation of self-care**. Dr. Brillon highlights the tendency of mental health professionals to forget themselves and not actively implement means to maximize their vitality, such as







Dr. Brillon rightly points out that repeatedly listening to traumatic stories exposes the caregiver to the “smallest and ugliest things a human being can do”. Therefore, she suggests that perceptions be rebalanced by exposing oneself to as much “human greatness and beauty” as possible, among other things.

a healthy lifestyle. She mentions that she has frequently heard caregivers say to her: “I never thought that I had to take care of myself”. These five explanations can add up and interact with each other: one mechanism alone does not usually explain the development of compassion fatigue and vicarious trauma.

#### To protect oneself from the stress of others...

The five explanations described suggest that it is possible to reduce the vulnerability of being overwhelmed by the suffering of others. Dr. Brillon generously shared with us a few

suggestions from her book. Her first suggestion is to get to know yourself better and identify the motivations behind the desire to help. The objective for the caregiver is to target their vulnerability factors that could be exacerbated by the experience of the person they are supporting. Then, Dr. Brillon insists on the importance of staying in touch with oneself. This can be a demanding process, as individuals in helping professions are very invested in the other's experience. Finally, Dr. Brillon rightly points out that repeatedly listening to traumatic stories exposes the caregiver to the “smallest and ugliest

things a human being can do”. Therefore, she suggests that perceptions be rebalanced by exposing oneself to as much “human greatness and beauty” as possible, among other things.

For 26 years now, Dr. Brillon has been working in a field that makes her feel the stress of others: yet, her passion and enthusiasm shine through when she talks about her profession! This is a good example of how it is possible to maintain vitality as a caregiver despite the years and nature of the work done! 🐾

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# Working in a stressful environment: testimonies of two healthcare workers during the COVID-19 pandemic

**Sandrine Charbonneau**, master's student in psychology, Centre for Studies on Human Stress, University of Montreal  
**Myriam Beaudin**, doctoral student in psychology, University of Quebec in Montreal



## Healthcare workers, on the front lines!

Over the past year, we have all had anxiety-provoking thoughts such as “have I caught COVID?” or “did I give it to someone I love without realizing it?”. Exposed to an environment with a high risk for virus propagation, healthcare workers had to deal with and face these thoughts on a daily basis. They overcame their worries and fears because it was their duty to work to care for others. For this reason, they are considered to be the heroes of this pandemic. However, this honorary title often comes with its own set of pressures because society relied heavily on them. How did working in a stressful environment affect healthcare workers?

Exposed to an environment with a high risk for virus propagation, healthcare workers had to deal with and face these thoughts on a daily basis. They overcame their worries and fears because it was their duty to work to care for others. For this reason, they are considered to be the heroes of this pandemic. However, this honorary title often comes with its own set of pressures because society relied heavily on them.

What strategies were used to cope? In this segment, we interviewed two healthcare workers to get their perspectives on the situation.

First, Mr. Mario Beaudin, a seasoned paramedic who has worked in the field for 40 years, described the reality of first responders during a pandemic. Having been in contact with many clients in different regions, he has been working in the Lachute region for several years. His role is to intervene in emergencies with sick people and to ensure their transportation to a hospital.

Next, Ms. Lucie Gagnon, director of care at the CHSLD Riviera Residence and the CHSLD in Laval, offers a perspective

on crisis management. Whether it be a hospital, rehabilitation centre or residential centre, each government health establishment must hire a director of care. This individual leads teams of nurses and orderlies to ensure safety and quality of care. Having worked in the healthcare field for 35 years, Lucie's role during the pandemic was to ensure the proper care and services for 230 residents and, by extension, 230 families.

## Stress during the different waves

The first aspect discussed was the evolution of stress during the pandemic. In analyzing our discussions with Mario and Lucie, we noticed that they addressed the four ingredients of the universal recipe for stress, i.e., novelty (N), unpredictability (U), threatening to the ego (T) and low sense of control over the situation (S) (a little trick to remember: don't go NUTS with stress!). The more ingredients a situation has, the more stressful it is. It is important to note that everyone interprets situations differently, so what stresses Mario will not necessarily be stressful for Lucie.



Mario told us that he experienced stress during the pandemic because the intervention protocols changed unpredictably and that there was novelty: “it is like working against a bad guy you do not know and who is hidden everywhere. For example, one day, we could not ventilate someone and the other day, it was okay. There was no reference point because people had never experienced this. We did not know what to do”. However, he seemed to cope well with the stress associated with his work because he had already experienced other similar crises in the past that were comparable to the coronavirus: “we already work in a stressful environment. In fact, I worked when there was influenza, H1N1 or Ebola”.

Unlike Mario, Lucie experienced increased stress during the pandemic. Her stress recipe included each of the NUTS ingredients. First, novelty (N) and unpredictability (U) exacerbated her stress. As few clear guidelines were given during the first wave of the pandemic, Lucie and her team had to anticipate health measures and build new protocols continuously. Furthermore, as the safety and lives of the residents and employees were at risk, there was a lot of pressure on the management team and everyone’s ego was threatened (T). Also, she felt a low sense of control over the situation (S) due to the extremely dangerous nature of the coronavirus in CHSLDs. She says that her stress “was at high and intense levels during the first wave. We were extremely vigilant and



we put many strategies in place to keep the situation under control”. Due to this relentless vigilance and continuous involvement during the first wave, her energy reserves were depleted and she is currently on sick leave: “my stress led me to burnout because I gave it my all, seven days a week and at least 18 hours a day. It was too much”. In fact, Lucie experienced the negative effects of chronic stress that occur when a person is exposed to a stressor continuously and for an extended period of time. It is as if the body’s alarm system is constantly being activated. It was activated for four consecutive months in Lucie’s case, which significantly contributed to draining her energy reserves. Imagine driving down the highway at 150km/h and never slowing down; your car will eventually run out of gas! However, it is essential to remember that humans often manage to

adapt, even in difficult and persistent situations: “during the second wave, it was a bit more relaxed. The stress level decreased, even though we felt that we were not in the usual state of things”.

### And once at home?

One technique for reducing the risk of chronic stress is to establish a clear line between work and personal life (easier said than done, admittedly!). This gives the body’s alarm system a break. Once at home, the individual has the opportunity to rest and take their mind off things. Mario seems to be able to balance work and family life: “for me, the important thing is to come home after work. I have the advantage of having a family waiting for me. I can unwind when I get home. I have activities outside of work”. Clearly, this was a determining factor in his adaptation to the pandemic. For Lucie, she mentions that she had difficulty drawing a line because once she arrived home, the coronavirus topic was taboo: “at home, it was difficult because we could not talk about the pandemic. It was like, ‘we are not talking about it, it is too irritating, we need to talk a break!’.

So, I had to keep it to myself and my thoughts were spinning around in my head. It was very difficult for me to unwind”. Along these lines, one of the ways to regulate an emotion is to externalize it. For example, by talking about your day. However, it is important to not fall into co-rumination, which involves talking to another person about a problem and continually mentioning the negative effects without finding solutions (we invite you to read the article





on the subject written by our colleague Rebecca Cernik). In the past year, the coronavirus was the topic of conversation and it was difficult to find a balance between externalizing emotions and rumination.

### Ready to face stress!

To cope with a difficult situation, Mario and Lucie developed coping strategies. Although several strategies exist in the literature, we will discuss those adopted by Mario and Lucie. The first is positive reframing, which involves taking a difficult situation and recognizing the positive elements in it. To do so, individuals transform hardships into life lessons or refocus on the positive elements of a situation. Mario exemplifies this strategy when he talks about the positive impacts of confinement: "I realized that happiness is in the little things. I realized that I was lucky that all my loved ones are healthy, bringing me closer to them. To get through it, I told myself that it could have been worse". We also find that Lucie expresses a form of gratitude which emphasizes her joy for being part of a committed team: "we overcame challenges as a team. This makes us grateful to be part of a great team and to have contributed to it".

Next, Lucie showed evidence of planning as she chose to deal with the



situation actively. Instead of repressing and ruminating, she used the mobilized energy from her stress to put tactics in place to deal with her problems: "I cut the mammoth into many small pieces to do my best every day". Her team assigned a nurse from the health office to follow up with employees who had tested positive. Lucie sent regular emails to families to let them know that the situation was being taken care of. In addition, her general manager made sure that three protective cloth masks were made available to all employees, even before it was made a mandatory measure. To keep them on track during

the storm, residents' families were invited to write comforting words to the employees.

Finally, although it can be difficult to cope with high levels of stress on a daily basis, it is also an opportunity to discover certain hidden strengths. Although we are at the mercy of an invisible virus, we are protected by modern heroes. 🐘

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# Stress resonance stress

Sonia J. Lupien, Ph.D., director of the Centre for Studies on Human Stress



Have you ever been in a great mood, walked into a work meeting with a super stressed person and then walked out of the meeting with a lump in your stomach and in a worse mood than when you walked in?

I think the vast majority of people who read the Mammoth Magazine will answer “yes”. If so, then you have experienced what researchers call *stress resonance*. In 2012, a team of researchers led by Dr. Tony Buchanan in the United States described this fascinating phenomenon.

## Stress resonance

In all scientific studies on human stress, researchers recruit participants and ask them to come to the laboratory. Once in the laboratory, they expose the participants

to a laboratory stressor (the recipe for which I will never tell you!). It is enough to say that when participants are exposed to the stress, research assistants are observing them and stress hormones are measured from saliva samples that are collected from the participant exposed to the stress.

Dr. Buchanan once wondered what was happening with the stress hormone levels of the research assistants who were observing the participants being exposed to stress. So, he measured the stress hormones of the observers. In about a quarter of individuals (25%), he showed that the stress hormones of the observers increased at the same time as those of the participants exposed to stress. The research assistants who observed the participants being stressed

“resonated” with the participants’ stress. Therefore, stress resonance does not happen in everyone (in about a quarter), but when it does occur, there is a clear resonance between the person who is stressed and the person observing them.

The second thing that Dr. Buchanan showed was that the best predictor of an observer’s stress resonance with the person under stress was *empathy*. Empathy is the ability to identify with what another person is feeling. Dr. Buchanan showed that observers who had higher levels of empathy were more likely to resonate physiologically with the stress of the person exposed to the laboratory stressor. What a result! With this first study, we began to understand why we tend to become stressed when we meet people who are stressed!

## Do we resonate with everyone and to the same extent?

Two years later, in 2014, a German researcher, Dr. Veronika Engert, decided to take the research a step further and asked herself whether we resonate with

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with everyone around us or whether we tend to resonate only with people we know.

Therefore, she asked couples to come to the laboratory and one member of the couple was exposed to the stressor while the other member was an observer. She compared the couples to another group of people who did not know each other. Again, one person was exposed to the stressor while the other was simply observing. Here, the idea was to see if stress resonance would be greater in couples than with people who do not know each other. The results showed that this is the case. Amongst the 25% of people who resonate with the stress of others, the researchers showed that stress resonance occurs in 40% of couples, whereas it only happens in 10% of people who do not know each other.

Again, a person's level of empathy is the factor that seems to determine stress resonance. A person with a higher level of empathy has a greater



likelihood of resonating with the stress of people around them.

### Do you have to be face-to-face for resonance to occur?

The next question that comes to mind when hearing these results is: "okay, but do you have to be in the same room as

the stressed person for stress resonance to occur?". To answer this question, Dr. Engert set up an experiment where a member of the couple or the observer of the dyad of strangers observed the other person being exposed to a stressor via a one-way mirror. In this condition, participants were not physically in the same room. Again, the results showed that there was stress resonance. So, people do not need to be physically in the same room to resonate with the stress of others.

### Can stress resonate through a computer?

The next question that arose for researchers was the following: can stress resonance occur when looking at a stressed person through a screen? The most interesting study on this topic was published by Stéphanie Dimitroff's team from the University of Chicago in 2017. In this study, the researchers filmed participants who were exposed to a laboratory stressor. When people are exposed to a stressor, some react with a very strong stress response (they produce a lot of stress hormones), others react with a medium stress response and others with a weak stress response. Therefore, the researchers created a series of videos for each of these three categories, i.e., weak, medium and strong stress response.

They also created videos of people who were not exposed to a stressor. Then, they showed the videos to the participant observers. The results showed that the observers' stress resonance was correlated

Can stress resonance occur when looking at a stressed person through a screen? The results showed that the observers' stress resonance was correlated with the participants' stress responses in the videos. An observer who watched a video of a participant with a very strong stress response produced a greater change in their stress response than an observer who watched a video of a participant with a weak stress response





with the participants' stress responses in the videos. An observer who watched a video of a participant with a very strong stress response produced a greater change in their stress response than an observer who watched a video of a participant with a weak stress response. When participants watched a video of a person who was not exposed to a stressor, the researchers observed no change in the observer's stress response.

Here, it should be noted that although the results of this study are very interesting, the researchers showed that the observers showed an inverse stress response to the participant in certain circumstances. The more the participant was stressed, the more the stress response of the observer decreased! Therefore, there is still a lot to discover about stress resonance.

### Implications

**In-person interactions:** The results showing a strong stress resonance with in-person interactions have important implications for healthcare and/or education workers as these individuals have to interact with people who may be stressed on a daily basis. This is especially important during the COVID-19 pandemic and it is becoming increasingly important to consider the health of



people who have to deal with highly stressed people on a daily basis.

### Meetings on Zoom, Teams and other platforms:

The results showing a strong stress resonance through screen interactions have important implications for all the virtual meetings on Zoom, Teams and other platforms. I do not know about you, but it happens quite often that I realize that someone in the group is particularly stressed and I can feel their stress resonating with me. Dr.

Dimitroff's results are extremely interesting in that they show that our stress response resonates with the person's stress level on the other end of the call. So, if we have daily encounters with a team member at work who is very stressed, this will have significant repercussions on the team's stress... and performance.

This is a factor that should not be overlooked! 🐘



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# Children who mop up the excess cortisol that adults left behind

Audrey-Ann Journault, doctoral student in psychology, Centre for Studies on Human Stress, University of Montreal



*"It was a big day at school today, dear. Zakary was in an unprecedented oppositional phase. Barely two minutes before the bell rang, Eva and Josiane blew up in the biggest fight of their whole relationship as best friends. It was enough to dampen the morale of every student who walked in the door. On top of that, my boss had just left my class after telling me that I would have a mandatory team meeting during my break. Maxim's father sent me a rude email because his child is still failing. I am doing everything I can, but despite his needs, I have no one in my class who can help him on a daily basis. I am at my wits' end. And the more I am at the end of my rope, the less my students cooperate. I had to stay at the end of the day to prepare for tomorrow's morning activity because I*

*could not do it during the break. I ran to get to the daycare in time to pick up Jacob and as soon as we got home, he threw one of his fits!"*

Do you believe that stress can be contagious? Studies suggest that stress can be transmitted between two people who are closely related. Three mechanisms can explain this stress contagion. For example, let us take a parent in a relationship who loses their job. First, the second parent is involuntarily exposed to a stressful event (the stressor). Second, it is expected that the parent who experienced the stressor will be able to express their negative emotions to the second parent and receive their support. Finally, because both parents are involved in each other's lives, they

are more vulnerable to each other's stress. A person's stress naturally spills over onto those in their immediate entourage.

We know that children's brains are not sufficiently developed to handle their stress on their own. The human brain has two important structures for stress management: the amygdala and the prefrontal cortex. The amygdala is the alarm system. It is very sensitive and detects all potential threats to prepare the body to deal with them rapidly. Its favourite saying is: preventing is better than healing. The prefrontal cortex is the alarm's brake. Full of wisdom, it analyzes the situation rationally and cancels or attenuates the alarm when it is not justified. Therefore, it is essential for a person to be able to manage their stress. Yet, the prefrontal cortex is the last brain structure to reach maturity in humans. On average, it begins to develop at the age of 8 and reaches maturity on average at the age of ... 29! For this reason, the parent plays an important "buffering" role in regulating

As an adult, it is sometimes difficult to manage this spillover. What about children who spend more than seven hours per day with a teacher at their wits' end and are exposed to stressed parents when they get home at night? Do they absorb this extra cortisol?



their child's stress. A study showed that when doing a stressful task in the laboratory, children produce fewer stress hormones (cortisol) if their parent is present with them during the task than when they are alone. This means that children are probably even more sensitive to the stress of their parents and teachers than adults would be since they are less capable of managing their stress by themselves.

Parents and teachers face a lot of pressure and stress. In 2018, up to 62% of parents reported that balancing work and family was an important source of stress for them and almost a third of Quebec teachers said they were emotionally exhausted. Keep in mind that it is also common for teachers to be parents themselves. Are children exposed to stressed parents and teachers more affected by stress?

Several years ago, researchers asked parents in relationships to note the stressors they experienced over several days and measured their parenting behaviours. The results of the study showed that parents are more susceptible to have tense interactions with their children when they have had arguments within their couple the day before. A few years ago, our research team also found that mothers' depressive symptoms are associated with their child's cortisol levels. The higher the mother's depressive symptoms, the more cortisol the child produced.



A study showed that when doing a stressful task in the laboratory, children produce fewer stress hormones (cortisol) if their parent is present with them during the task than when they are alone. This means that children are probably even more sensitive to the stress of their parents and teachers than adults would be since they are less capable of managing their stress by themselves.

A similar contagion has been observed between a teacher's level of professional burnout and students' cortisol in their class. Studies also suggest that students' motivation and achievement appear to be negatively associated with their teacher's level of depression. For example, students were less motivated and less successful when they were in

a class of the most exhausted teachers. However, none of these studies provide evidence of a causal link. The teacher's higher levels of burnout and depression could also be because the students are more stressed, less motivated and less successful. More research is needed to answer this question! Nevertheless, taken together, these studies suggest that stress in adults and children is closely related.



For this reason, as an adult, it pays to take care of your own stress before helping a child or student with their stress. The [16<sup>th</sup> issue](#) of the Mammoth Magazine suggests individual ways to do so. You will also find a complementary toolbox at the end of the current issue. However, there are also institutional and social solutions that could be put in place to promote parents' and teachers' mental health and well-being. To this end, the Conseil supérieur de l'Éducation of Quebec published a report in January 2021, recognizing that teachers sometimes have too few many resources to adapt to the level of stress they experience on a daily basis. Among the



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resources proposed in this report, we find the development of social and emotional skills in the training of teaching personnel, access to training and coaching, recognition that student success is not solely dependent on teaching personnel and instrumental support (e.g., technical assistance).

In conclusion, remember that even though stress can be sometimes unpleasant to experience, it has an adaptive function that allows humans to survive and adapt to their environment. Consequently, no human being is free of stress. Therefore, the best strategy is not to avoid it at all costs but rather

to teach the child or student to accept and manage it so that they can tolerate it. Fortunately, children learn a lot from observing their favourite role models manage their own stress, such as their parents and teachers! 🐾

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# Observational fear learning: when mom or dad get involved?

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Small confession: I am scared to death of hitting a moose with my car! As soon as I see a road sign for moose crossings, I become hypervigilant and scan the horizon for the animal, convinced that it would suddenly appear in front of my car and poof! Collision guaranteed! A bit dramatic, don't you think? Especially since I have never seen a moose on the side of the road during one of my many trips across Quebec. Then why am I so afraid? Well...it is my mother's fault! I think back to a family trip when I was 7 or 8 years old...we were driving at night to Saguenay on a small winding road. I was sitting in the back seat of the car, watching my mother...who was carefully scanning the horizon out of fear that a moose might appear in front of the car. It never happened, but here I am, 20 years later, with the same fear of hitting a moose! This is what we call observational fear learning.

As the name suggests, this type of learning simply means learning fear by observing the reaction of others. This phenomenon has been studied repeatedly

in the laboratory in humans and many animal species such as primates, rodents, birds and cats. It can certainly be adaptive (it is practical to learn not to put your hand on a stove without getting burned!), but sometimes it can also play tricks on us (my fear of moose is not very helpful)! In childhood, it is particularly important because children rely heavily on their parents' reactions to know how to react to their environment. Several studies have demonstrated this in a laboratory using experimental protocols. For example, researchers asked mothers to make a negative facial expression (e.g., fear) while handling a toy while their child watched. Then, when the children were asked to handle the toy, they were afraid of it, like their mother! In line with this, another group of researchers

presented children with pictures of unfamiliar animals with the face of their mother or a stranger expressing either fear or joy. Again, the children were more afraid of the animals that were associated with the frightened face of their mother or the stranger, whereas they did not fear those that were associated with joyful faces.

We tried a similar experiment in our laboratory: mothers and fathers participated in a scenario where they learned to fear a neutral stimulus (e.g., a colour) while their children watched them. The children then participated in the same scenario – do not worry, it generates a tiny bit of stress for a short period and the children had accepted to participate. To measure fear, we recorded their skin conductance (this is

For example, researchers asked mothers to make a negative facial expression (e.g., fear) while handling a toy while their child watched. Then, when the children were asked to handle the toy, they were afraid of it, like their mother!

a physiological fear response: the more afraid you are, the more you sweat!). As in the previous experiments, the children were afraid of the neutral stimulus that scared their mother or father. These experiments show that children can learn to fear certain objects or situations by simply observing their parents! However, not all children learn fear by observation in the same way and some are more sensitive to their parents' reactions. But why?

Recently, researchers have shown that physiological synchrony between two people can increase observational fear learning. What is physiological synchrony? It is when two biological systems (e.g., heart rate) vary in the same manner over time. The researchers exposed a person to an aversive situation (the demonstrator) while another person watched (the observer). When the demonstrator and observer had strong physiological synchrony, the observer had higher physiological levels of fear (measured by skin conductance) when exposed to the situation thereafter. Therefore, physiological synchrony seems to increase observational fear learning. As I am so afraid of moose, one might assume that I was probably in physiological synchrony with my mother when I was watching her from the back seat!

The attachment style between a parent and child also seems to influence fear



These experiments show that children can learn to fear certain objects or situations by simply observing their parents! However, not all children learn fear by observation in the same way and some are more sensitive to their parents' reactions.

regulation in children. You are probably familiar with the concept: a child with a secure relationship with their parent will develop a sense of security as the parent is available, attentive and sensitive to their needs. In contrast, a child who has an insecure relationship with their parent will often find themselves alone to regulate their emotional reactions and develop alternative strategies that are not

always adaptive. Our research team questioned whether the parent-child attachment style could influence observational fear learning. Within the aforementioned experiment, we found that anxious children who had a less secure attachment with their father were more afraid of the neutral stimulus that had frightened their mother or father. In contrast, attachment style with the mother does not seem to influence observational fear learning. Warning, this does not mean that the relationship with mothers does not influence this type of learning. Other studies would need to find the same results! Here, it is important to remember that a secure relationship with the father could be particularly beneficial for anxious children, notably by helping them have better regulation of their fear.

As you can see, many factors can influence observational fear learning. We have named a few here and research will surely find others in the years to come! One thing is certain: parents play a central role in role in observational fear learning in children.







The attachment style between a parent and child also seems to influence fear regulation in children. You are probably familiar with the concept: a child with a secure relationship with their parent will develop a sense of security as the parent is available, attentive and sensitive to their needs. In contrast, a child who has an insecure relationship with their parent will often find themselves alone to regulate their emotional reactions and develop alternative strategies that are not always adaptive.

And although fear is adaptive, it must be in moderation! If it takes up too much space, it can lead to the development of certain mental health disorders such as anxiety, phobias, etc. To the parents reading this article, do

not be too worried! Although your child is watching you in situations of fear and is learning, it is normal to be afraid in certain contexts. Think of me; I will probably never hit a moose! 🐻

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# Birds of a feather flock together.... and become more alike!

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## In an adolescent's shoes

You are back in high school. You walk into the cafeteria and have to decide which table you are going to sit at. It is a crucial choice because you know that it will determine what social group you will be associated with. Hmm, which will you choose? You start looking at each table: there are the jocks, nerds, populars, artists, comedians and many others. Each group has its particularities. In fact, you notice that the members of each group resemble each other: they walk the same, have the same interests, same clothing style and the same facial expressions! It is as if they were carbon copies of each other! You may wonder ... why?

### "Who am I?"

As adolescence is a pivotal period in identity development, much research

has been done on peer influence at this age. Peers are individuals of the same age with similar characteristics and abilities. In their desire to discover their identity, adolescents are susceptible to the influence of their peers. The opinion of peers is important to feel validated and accepted. Thus, a young person will be inclined to imitate their peers' behavior to conform to social norms of the group they belong to. These norms define the rules of conduct to be followed (e.g., get good grades for the nerds, excel in sports for the athletes, participate in social activities for the populars). They emphasize behaviours based on a specific set of beliefs and values. When an adolescent imitates their friends' behaviours, they receive reinforcement. This reinforcement can be verbal, such as a "Good job! That's

great!" or through actions such as laughter, a pat on the back or a glance. In both cases, reinforcement encourages the teen to repeat the behaviour. Therefore, during adolescence, it is clear that peers have a strong influence on a young person's behaviour.

### "If you do it, I do it too!"

Peer influence was first studied in deviant youth due to the risk of dropping out of school. These studies revealed that within these groups that value disobedience, aggressiveness and substance use (drugs, cigarettes, alcohol), adolescents tend to adopt the behaviours of the reference group (lying, hitting or stealing). They also seem to consume more illegal substances and have higher rates of delinquency.

Although peers sometimes reinforce inappropriate behaviours, they can also promote the adoption of beneficial habits. In a school setting, it has been shown that when a young person affiliates with friends who are dedicated to school, they become more motivated to do better at school. Peers can also influence the adoption of prosocial

Indeed, recent research shows that the more time adolescents spend with their friends, the more they will develop the same characteristics as them. In other words, groups of young people become similar over time! This phenomenon is called socialization and explains why we adopt the same expressions as the members of our entourage (friends, family) after spending time with them.



behaviours, which aim to help others (e.g., sharing, helping others, altruistic acts). When a young person perceives their friends as altruistic, they are more likely to display more of these social behaviours to feel accepted and valued in the group. An experimental study conducted with youth ages 12 to 16 years old indicated that peer feedback is also very important. When peers give their approval, the young person will tend to display more altruistic behaviours and conversely, if they disapprove, the young person will decrease or even stop the behaviour.

Peer influence can also be seen in mental health, notably with anxiety. A study in 2011 was interested in the effect of peers on social anxiety, a type of anxiety characterized by high nervousness and a profound discomfort in social situations. The results are quite striking: young people with symptoms of social anxiety tend to affiliate together and with time, their individual levels of social anxiety are higher. This raises the question as to whether the same effect occurs with test anxiety in school settings. We are currently working on this research topic at the Centre for Studies on Human Stress and will be able to give you an answer in the near future.



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In conclusion, the decision of which table to sit at during lunch hour in high school has a much greater impact than one might imagine! Indeed, peers are

powerful influences in adolescence. What about at other times in our life? More research is needed to elucidate this question. 🐼

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# Let's talk: A look at co-rumination and stress hormones in friendships

Rebecca Cernik, master's student in biomedical sciences, Centre for Studies on Human Stress, University of Montreal



Emily: "Sarah-Jeanne, we need to talk! My boyfriend has been acting so weird lately ... I think he is going to break up with me! I need to talk to you about everything that has happened to find out what I could have done to make him act this way!"

Sarah-Jeanne: "Oh no, that sounds horrible. You must be so upset! Tell me every detail! I am free all evening to talk about it. We will get to the bottom of it!"

Have you ever found yourself in a similar conversation with a close friend? Or maybe the topic was about a recent argument you had with your mother or a problem you are having at work? If yes, like our fictional best friend duo

Emily and Sarah-Jeanne, you may have engaged in co-rumination.

## What is co-rumination?

Co-rumination occurs in a dyad (i.e., two people) where a problem is discussed endlessly from all angles, about why the problem has arisen and what might happen as a result. The dyad members may even encourage problem discussion and focus on negative feelings, such as sadness and anger. Most studies look at co-rumination between two close friends but know that it can also occur with your partner and even a parent.

Co-rumination is a double-edged sword. On the one hand, studies have

shown that co-rumination allows us to feel closer to our friend, but it has also been associated with depression and anxiety. In addition, it is important to note that women co-ruminate more than men, which is why some studies have only focused on women.

## Co-rumination and stress: what's the link?

To better understand the link between co-rumination and stress, let us quickly recap what a stress response is. Let us imagine that a small kitchen fire starts in your apartment. At first, the smoke sets off the fire alarm in your apartment. As the fire grows, it sets off the building-wide alarm and alerts the firefighters. The building-wide fire alarm is only turned off once the fire is put out. This is similar to what happens when we experience a stress response. Your brain detects the threat (**fire**), which triggers the first system, the sympathetic nervous system (**the fire alarm in your apartment**). This prompts your body to produce adrenaline and

Co-rumination occurs in a dyad (i.e., two people) where a problem is discussed endlessly from all angles, about why the problem has arisen and what might happen as a result. Co-rumination is a double-edged sword. On the one hand, studies have shown that co-rumination allows us to feel closer to our friend, but it has also been associated with depression and anxiety.



other substances, indicating that you should flee! If the fire persists, a second system called the hypothalamic-pituitary-adrenal axis (**the building-wide fire alarm**) is activated and leads to the production of cortisol, the main stress hormone. When the fire is put out, your body will put the brakes on your stress response. In analyzing your saliva, scientists can see how active these two systems were! To do so, scientists examine two substances: alpha-amylase and cortisol.

In 2005, a group of researchers developed a protocol to study co-rumination in the laboratory. This protocol asks each member of a dyad to write a list of their current problems. The dyad is then asked to discuss one of the problems written by one (or both) of the members to encourage co-rumination or do another task that does not involve talking about a problem (control group). Each of the studies summarized below used this protocol to study co-rumination in the laboratory.

In 2008, researchers wanted to know whether co-rumination could trigger a stress response. Among the 24 friend

In 2008, researchers wanted to know whether co-rumination could trigger a stress response. Among the 24 friend dyads in the study, the results showed that the women who discussed their problems had higher cortisol levels than the women in the control group following their co-rumination task



dyads in the study, the results showed that the women who discussed their problems had higher cortisol levels than the women in the control group following their co-rumination task. The researchers also pointed out that even if friends co-ruminated during the control task, it was not enough to increase their cortisol levels! This suggests that co-ruminative conversations

must be about personal issues to increase stress hormones.

### Adding another piece to the puzzle

In 2010, researchers sought to better understand the link between co-rumination and stress by examining how the two stress systems (sympathetic nervous system and the hypothalamic-pituitary-adrenal axis) respond to co-rumination. They found that when two friends co-ruminate about a problem, their stress systems activate differently depending on the degree to which they focus on the negative feelings (sadness, anger) that the problem makes them feel. Indeed, when the friends focused heavily on the negative feelings the problem made them feel, the two stress systems were highly active. However, when the friends focused very little on these negative feelings, the system triggering adrenaline was more active than the system that triggers cortisol. The researchers suggested that this strong activation of both stress systems that occurs when a dyad focuses on negative feelings during co-rumination may explain why it is associated with depression and anxiety. Obviously, more studies are needed to understand this phenomenon better!

### What happens to me, happens to you

We now know that co-rumination and stress are related ... but we also know that co-rumination takes two to tango.



This begs the following question: could two friends have synchronized cortisol levels (i.e., similar) after co-ruminating together?

In 2018, a group of researchers explored this question. By studying 37 dyads, the researchers showed that the friends' cortisol levels were synchronized after co-ruminating. According to the researchers, while this synchronization can be seen as a bad thing, it can also indicate our investment in the friendship and be beneficial for solidifying the relationship.

### What should I take from this?

Does this mean that we should never have a venting session with a friend ever again? Not exactly. As explained in this article, co-rumination allows us to feel close to our friend. However, it can trigger a stress response and has been associated with mental health problems, such as depression and anxiety. Co-rumination is probably something you already do or have done but could not



name. The purpose of this article was to introduce you to co-rumination and its positive and negative aspects so that the next time a conversation with a friend is turning in circles and is focusing a bit too much on the negative, you will be better informed! 🐾

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# Toolbox: Helping without losing your marbles

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Yasmine Zerroug, *doctoral student in psychology, University of Quebec in Montreal*

Not sure where to start? To help you better manage the stress of others and your own, we have prepared a toolbox containing different resources. Whether it be for your own personal use, to give you the tools to help a loved one or simply gather valid information about stress, the following resources can act as a starting point. You will find a repertoire of books, hotlines, mobile applications, as well as stress management techniques.

## Need more information?

In the following section, you will find several books that will help you learn more about your stress, the stress of others and its consequences. You will find a section for everyone and one specifically dedicated to professionals.



## FOR EVERYONE

Would you like to learn more about how other people's stress can affect you or about the mechanisms of stress? Here is a list of relevant books written by professionals in the field.



**“À chacun son stress (2019)”** by Sonia Lupien, Ph.D. (available in French)  
Title translates to “To each their stress”. This book shows how parents’ stress can spillover onto their children and offers several scientifically validated tools to manage stress as a parent.



**“Par amour du stress 2e éd. (2020)”** by Sonia Lupien, Ph.D. (available in French)  
Title translates to “For the love of stress 2<sup>nd</sup> edition”. In this book, Sonia Lupien reports the scientific results of studies on stress over the past 20 years. This 2<sup>nd</sup> edition illustrates the principal causes, symptoms and consequences of chronic stress. The author also proposes concrete ways to manage stress.



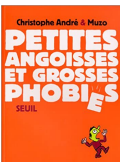
**“Arrêter de vous faire du souci pour tout et pour rien (2014)”** by Robert Ladouceur, Ph.D., Lynda Bélanger, Ph.D. and Éliane Léger, Ph. D. (available in French)  
Title translates to “How to stop worrying about everything and nothing”. Do you think you are very anxious? This book offers a program with quizzes, questionnaires and practical exercises to overcome this chronic anxiety.



**“The Happiness Trap” (2009)”** by Dr. Russ Harris, MD.  
This book questions our pursuit of happiness and its stressful and anxiety-provoking effect. The author proposes techniques for dealing with the thoughts and emotions associated with the pursuit of happiness.



**“La peur d'avoir peur: guide de traitement du trouble de panique 4e éd. (2018)”** by André Marchand, Ph.D., Andrée Letarte M.Ps. and Amélie Seidah, Ph.D. (available in French)  
Title translates to “Afraid of being afraid: a guide to coping with panic disorder and agoraphobia”. Many of us live in fear: fear of not being loved, fear of not being enough. In this book, the authors propose a self-help guide for individuals with panic disorder and other anxiety disorders.



**“Petites angoisses et grosses phobies (2007)”** by Dr. Christophe André, MD. and Muzo (available in French)  
Title translates to “Small anxieties and big phobias”. This book and its illustrations aim to give tools to people with anxiety, as well as their loved ones. The origins of our different fears and anxieties are exposed with a humorous perspective.



**“Pensouillard le hamster (2011)”** by Dr. Serge Marquis, MD. (available in French)  
Title translates to “The thinking hamster”. Do you feel like the hamster in your head never stops working? This book will help you take a step back and learn to slow down, step by step.

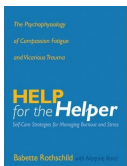


## FOR PROFESSIONALS

Being in the helping profession can sometimes lead to compassion fatigue. To inform you on the subject and equip you as a caregiver, here is a list of books written especially for you by experts in the field.



**“Entretenir ma vitalité d'aidant (2020)”** by Dr. Pascale Brillion, psychologist (available in French)  
Title translates to “Maintaining my vitality as a caregiver”. Whether you are a psychologist, social worker, doctor, therapist, mental and physical health professional, humanitarian worker or first responder, this book will allow you to reflect on your profession, where the distress of others is present. The author offers insight into your distress as a caregiver, as well as strategies to help you overcome your compassion fatigue.



**“Help for the Helper: The Psychophysiology of Compassion Fatigue and Vicarious Trauma (2006)”**  
by Babette Rothschild, M.Sc. and Majorie Rand, Ph.D.

This book offers various tools to help professionals deal with the distress of others without being overwhelmed and maintaining a certain level of well-being.



## APPLICATION TOOLS

Would you like to have practical and concrete tools for stress management? This section is for you. You will find mobile applications as well as books that will allow you to apply validated strategies. However, it should be noted that these tools do not replace a professional's help, which is necessary in some cases.



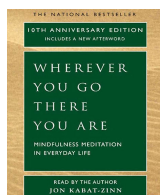
**iSMART** (Stress Monitoring Assessment and Resolution Technologies) is a mobile application (available on Google Play and the App Store) developed by the Centre for Studies on Human Stress. The tool allows you to target the triggers that generate a stress response and techniques to help you face your mammoths. You will also find a wealth of information on stress. <https://centreaxel.com/en/projects/ismart-en/>



**MindShift** is a mobile application (available on Google Play and the App Store) based on the cognitive behavioural approach. This tool allows you to target your anxiety-related thoughts and behaviours and develop stress management strategies. <https://www.anxietycanada.com/resources/mindshift-cbt/>



**“Heart coherence 365: A Guide to long lasting heart coherence (2019)”** by David O'Hare, MD.  
Heart coherence is a breathing technique that is known for its many benefits, including lowering stress hormones. This book is a perfect guide to walk you through the daily practice of this technique.



**“Wherever You Go, There You Are: Mindfulness Meditation in Everyday Life (2013)”** by Jon Kabat-Zim, MD.  
Anxious people have a strong tendency to live in the past (rumination) and in the future (anticipation), which contributes to their high levels of anxiety. Mindfulness, a technique from cognitive-behavioural therapy, is a way to train the brain to focus on the present moment, thereby reducing anxiety levels. This book will guide you in the daily application of mindfulness.



For more techniques on how to manage stress, see the [16th issue of the Mammoth Magazine](#) (Fall 2016).





## OUT OF BREATH?

The following section lists professional mental health resources so that you can get support if you need it. These hotlines are dedicated specifically to caregivers so that they can direct you to the right resources



**Écoute entraide** (available in French) is a hotline for anyone who wants to vent and share a difficult and distressing situation. Volunteers are available seven days a week from 8 am to 10 pm at 514-278-2130 (for the Montreal area). Outside Montreal (toll-free) at 1-855-365-4463.



**Info-Social** is a telephone service that allows you to speak with a psychosocial therapist for yourself or a loved one. The service is available at all times throughout Quebec at 811.



**L'Association québécoise des parents et amis de la personne atteinte de maladie mentale** (available in French) is a telephone listening service by a peer support worker, whose role is to help another person with mental health problems. All peer support workers are trained to accompany you. The service is available on Mondays from 1 pm to 5 pm and Tuesdays to Thursdays from 1 pm to 8 pm at 1-800-349-9915. Visit their website; you will find many resources such as support groups, information sessions and others.  
[www.aqpamm.ca](http://www.aqpamm.ca)



**Phobies zéro** (available in French) is a helpline for people with an anxiety disorder and their entourage. The service is available Monday to Friday from 9 am to 9 pm at 514-276-3105 / 1-866-922-0002.



**Réseau avant de craquer** (available in French) is a community organization that brings together several Quebec resources whose mission is to support the loved ones of a person with a mental health problem. Visit their website to find several resources by region under the "contact us" tab; [www.avantdecraquer.com](http://www.avantdecraquer.com). By phone at 1-855-272-7837.



**Service Info-aidant** (available in French) is a professional telephone service for caregivers, healthcare professions, family caregivers and their entourage. Available 7 days a week from 8 am to 8 pm at 1-855-852-7784.



ORDRE DES  
PSYCHOLOGUES  
DU QUÉBEC

**Ordre des psychologues du Québec** Studies show that cognitive-behavioural therapy is an effective approach to manage stress and anxiety disorders. To find a health professional for a personalized follow-up suitable to your needs, consult the website of the Ordre des psychologues du Québec: <https://www.ordrepsy.qc.ca/english>. To help you navigate the website to find a professional, see the article "finding a psychologist online" in the 16<sup>th</sup> issue of the Mammoth magazine.

## NEXT ISSUE OF THE MAMMOTH MAGAZINE



Although the pandemic has affected all population groups, we must admit that the elderly was hit particularly hard. How did they manage? What are the factors that promote successful aging? Undoubtedly, there will be some words of wisdom to retain. The next issue of the Mammoth Magazine will deal with these themes, do not miss it! See you in fall 2021! To all of you avid readers of the Mammoth Magazine, have a good summer!

## MAMMOTH MAGAZINE

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