

THE OFFICIAL
MAGAZINE
OF THE CENTRE
FOR STUDIES ON
HUMAN STRESS

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Living the Post-Traumatic State from Scientific and Clinical Perspectives

Robert-Paul Juster, Myra Gravel Crevier, & Marie-France Marin

For Martin, it started as terrifying flashbacks of his car crash months earlier. Without warning the slightest sound of a car engine or a random honk yards away would drive him into a state of sheer panic. Uncontrollable reminiscences of this traumatic event would rapidly lead to a racing heart, sweating skin, knotted stomach, and feelings of utter dread as if death was just around the corner. Martin no longer wants to drive and the rare times that he took the wheel, he freaked out and anticipated nothing but dangerous maneuvers from passing cars. Others have noticed that his behaviors are no longer the same: his wife and children find him a changed man that is more nervous and agitated. They simply do not understand what is going on. The first time he had a panic attack, Martin rushed to the hospital thinking he was having a heart attack since he felt horrified and could not breathe. According to the doctors, it turns out his heart is not the problem. It is rather his brain that is over-reacting to stimuli that remind him of his traumatic event. This disabling state of anxiety is known as post-traumatic stress disorder (PTSD) and can happen to anyone.

Martin is not alone in experiencing this kind of traumatic event. In fact, about 81% of men and 74% of women in Canada report past experiences or witnessing events deemed "potentially traumatizing" over the course of their lives (for example, a car accident, physical or sexual abuse, or witnessing an incident such as another's death). This being said, it is not everyone who develops PTSD as the lifetime prevalence in the general population is between 7% and 9%. Interestingly, women are two times more likely to develop a diagnosis of PTSD (13% in contrast to 6%). This statistic could be partially explained by the fact that men and women are not exposed to the same kinds of traumatic events. In effect, men are more likely to be exposed to accidents and physical aggression while women report experiencing more traumatic events like sexual abuse and domestic violence from interpersonal sources. Even when men and women are compared to each other in terms of the same types of events experienced, the severity of PTSD remains higher for women. It seems that women may be more vulnerable, but the reasons for this predisposition remain elusive.

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Living the Post-Traumatic State from Scientific and Clinical Perspectives



Other risk factors have been identified in the PTSD literature. It seems that a past history of mental health problems renders an individual more vulnerable to developing PTSD following exposure to trauma. In addition, previous exposure to a traumatic event can also increase one's susceptibility. Interestingly, it seems that individuals who hold the view that the world is just and good and see themselves as invulnerable appear to be less capable of coping to traumatic events as this shatters their personal beliefs. Following or during traumatic events, victims that experience more intense emotional and/or physical reactions are at greater risk of seeing their symptoms develop into PTSD. Conversely, peri-traumatic disassociation, that is, to behave as if completely detached from the events, seems to also carry increased risks.

These are just some of the risk factors conferring greater vulnerability to PTSD. Another important factor identified is social support. The quality of social support received represents two sides of a coin as either a risk factor or a protective factor. Adequate support provided by family and friends can help the victim feel a certain level of validation (for example, to allow the victim to vent about her feelings or to help her change her mind). However,

certain reactions can harm the victim's recovery, such as critique or blame that would often lead to guilt and isolation. It is important to note that social support as well as distress and disassociation surrounding the traumatic event appear to be better predictors than vulnerability factors before the trauma. Despite all of this, much more research needs to be done on this topic if we wish to better understand how a significant minority of individuals develop PTSD following a potentially traumatic events while other victims manage to successfully avoid succumbing to the disorder.

This 12th issue of *Mammoth Magazine* is devoted to post-traumatic stress disorder (PTSD). In the aims of providing you with an issue that is as informative as possible, we have allied ourselves with the Centre d'Étude sur le Trauma (CET) of Fernand-Seguin Research Centre at Louis-H. Lafontaine Hospital. Directed by Drs. Stéphane Guay and André Marchand, the CET is specialized in the world of PTSD. Thanks to our partnership for this 12th issue of Mammoth Magazine, you will find a richness of information pertaining to PTSD.

We begin this issue with the research profile of Dr. Stéphane Guay known widely for his work on PTSD. This article was written by Mya Gravel Crevier, a Doctoral student in Psychology at the University of Quebec in Montreal under the supervision of Drs. André Marchand and Stéphane Guay at the CET. Her scientific portrayal of Dr. Guay highlights some of his key research areas as well as some of his most important research findings. Specifically, Dr. Guay is an expert on the role


social support has in PTSD. You will see how there are no simple answers since several factors can be advantageous or disadvantageous when it comes to the quality of the support obtained, which has an important impact on the progression towards PTSD.

In our second article, Dr. Suzie Bond, a scientist-practitioner psychologist from the Centre d'expertise pour personnes victimes de brûlures graves de l'Ouest du Québec du Centre hospitalier de l'Université de Montréal (CHUM) authors a very interesting article on the different treatment options in PTSD. At what moment must I seek help? Should I opt for medication or even therapy? Are all types of therapies offered scientifically effective? How do I assure myself that my therapist is qualified to adequately help me? Here are but a sample of the questions Dr. Bond answers throughout her article.

Next, Isabel Fortin, Doctoral candidate in Criminology at the University of Montreal under the supervision of Dr. Stéphane Guay of the du CET of Fernand-Seguin Research Centre at Louis-H. Lafontaine Hospital authors our third article. Ms. Fortin has written a very informative article in collaboration with the Crime Victims Assistance Centre (CAVAC) of Montreal. She addresses the services offered free of charge by the CAVAC to all individuals who are victims of criminal acts. These services are varied and adapted to the needs of the victim. Inform yourself of this super resource available in Quebec that is too often unknown to the general public.

Finally, Marie-France Marin, Doctoral candidate in Neurological Sciences at University of Montreal under the supervision of Dr. Sonia Lupien from the Centre for Studies on Human Stress of Fernand-Seguin Research Centre at Louis-H. Lafontaine Hospital co-authors with Dr. Lupien the last article of this 12th issue of *Mammoth Magazine*. She synthesizes results obtained from certain studies she conducted throughout the course of her Doctoral studies. These studies were originally based on data from laboratory research on animals that have been translated to healthy human populations. Her findings seem to show promise and give hope for PTSD victims in the not so distant future.

On this note, it is our wish that this 12th issue of *Mammoth Magazine* empower you with information as well as sensitize you to the realities faced by victims of traumatic events and the different services at their disposal. Please do not hesitate to share these resources with your social networks. Indeed, no one is immune to facing traumatic events and the consequences that can ensue.

We hope you enjoy reading this issue! 

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Researcher's Profile: **Stéphane Guay, Ph.D.**

Towards a Better Understanding of the Role Social Support Plays Following a Traumatic Event

Myra Gravel Crevier

Translation: Robert-Paul Juster

Biography

Dr. Stéphane Guay is a psychologist and associate professor in the School of Criminology at University of Montreal. In partnership with his colleague, Dr. André Marchand, he founded the Centre d'étude sur le trauma (CET), where he functions as a director (see Box 1). The common thread of his research is the fascinating process associated with social support following a traumatic event. More precisely, his research can be principally divided into two domains: 1) identification of specific components of social support which can help rehabilitation among victims of traumatic events and 2) amelioration of psychological interventions tailored for individuals who have developed post-traumatic stress disorder (PTSD).

Previous studies

Dr. Guay's research career started with research on social support in relation to PTSD; that is, the collective effects of helping behaviors enacted by those close to victims of traumatic events. For example, the results from one of his studies demonstrated that following a traumatic event, it is possible for victims to develop post-traumatic symptoms. The presence of these symptoms, the distress experienced as well as the negative impacts on daily functioning often trickles into marital difficulties. Indeed, victims who develop PTSD report several difficulties in marital adjustment vis-à-vis intimacy, the enactment of daily tasks, the education of children, sexuality, finances, and the

expression of emotions. Loved ones can also experience difficulties adjusting to these sudden changes and are also more likely to experience distress.

It is therefore clear that social support is very important, but it seems that different elements can diminish the quality of the support that can bring about negative repercussions. While loved ones generally have all the best intentions in the world to positively assist victims, it would seem that certain behaviors (for instance, minimizing the gravity of the events, avoiding discussion of the event with the victim) can inadvertently contribute to the maintenance of symptoms. Likewise, it has been shown the inadequate social support represents one of three risk factors most strongly associated with the development of PTSD. Dr. Guay's work underlines the importance of the multidimensional aspects inherent to the concept of social support (for example, the needs of victims versus the types of support they received from loved ones). Following a traumatic event, the loved ones of victims can provide help in several ways such as offering a sympathetic ear, clear and immediate help, as well as advice or even just by sharing pleasurable activities together.

A very interesting idea at the heart of Dr. Guay's research is the perceptual distinctions between actual support received in relation to perceived support. Indeed, the majority of studies on this subject assess the perception of support, which can quite obviously be tainted by personality traits and moods of the victim. So, what would an objective measure of social interactions be? In order to better understand the difference between objective support received and the perceived support felt by the victim, Dr. Guay developed a novel observational system allowing the examination of social support. In a laboratory room, the victim suffering of PTSD is invited to discuss with a significant other the impact of the disorder in their life and this, for a 15 minutes time period during which they are videotaped. Then, the positive and negative social interactions are analyzed by external judges according to a validated analysis grid. The research results show that the perception of the support (evaluated with questionnaires) and



the observed social interactions (based on the observational system) represent two distinct realities, but remain complementary.

In a similar vein, Dr. Guay developed and validated a new scale that measures the quality of supportive behaviors (positive or negative) offered by a significant other. This research will open the door to understanding in greater detail the manner in which our loved ones can influence the progression or not of PTSD.

Current studies

Currently, Dr. Guay's studies are being conducted among victims of violent acts, social support, as well as psychological interventions. Moreover, one research project currently underway aims at evaluating the long-term impacts of a brief and effective cognitive-behavioral intervention that prevents the development of PTSD. In this manner, the spouse or someone close to the victim takes part in several therapeutic sessions. This project will allow for the examination of social support offered over

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Some recent results obtained by Dr. Guay demonstrate that it is effective to include a spouse in certain therapeutic sessions, as this allows for a more favorable comprehension of the disorder, encourages communication and demystifies helpful attitudes and behaviors. It would seem that not only does this manifest itself overall improvements in the psychological well-being of victims, but it also leads to an amelioration in the satisfaction felt towards the support received.

Researcher's Prolife: Stéphane Guay, Ph.D.

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Over time, a recurring theme observed by Dr. Guay's research team, as well as previous work in the literature, is important differences between men and women in terms of PTSD. For example, one study indicated that social support represented a positive predictor for psychological well-being particularly among women. This is why he is increasingly interested in understanding how the differences between men and women is linked to their unique needs for support.

Recently, the Canadian Institutes of Health Research (CIHR) Institute of Gender and Health awarded a team grant with Dr. Guay as the principal investigator in order to run a project entitled "Towards a better treatment of victims of violence in the workplace." This project targets primary, secondary, and tertiary prevention of serious violence experienced in several risky workplace settings. Throughout, careful attention will be placed on differences between men and women. This project will be financed over five years and will benefit from the strong collaboration among the primary actors in these milieus as well as researchers from various disciplines.

The importance of collaboration and knowledge transfer

The research interests of Dr. Guay are diverse and have led to several fruitful collaborations. Notably, he collaborates in the evaluation of an emergency psychological intervention that was implemented based on the horrific shootings on September 13th 2006 at Dawson College. He has also collaborated on projects on domestic violence among young adults, PTSD among military personnel and veterans, the development and utilization of new technologies (for example, virtual reality and telepsychotherapy), the marital and social functioning of women afflicted with breast cancer as well as the integration of treatments for the relief of PTSD and disorders related to substance abuse.

Dr. Guay recognizes the importance that scientific knowledge be transmitted to all members of society. In so doing, the results of his numerous research endeavors have been communicated at diverse international congresses, prestigious journals, and conferences for the general public. In addition and with his psychologist colleague Dr. André Marchand, they have compiled an important reference work entitled: "Les troubles liés aux événements traumatiques: Dépistage, évaluation et traitements" (English translation: "Disorders related to traumatic events: detection, evaluation, and treatments")

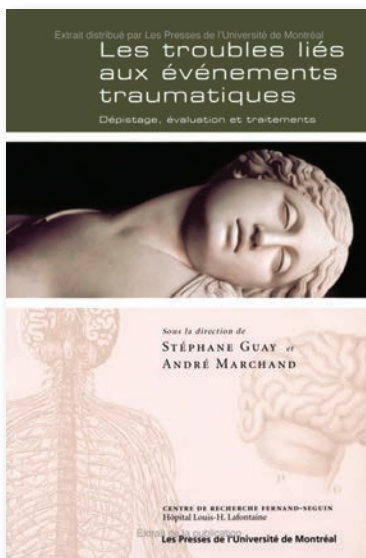
The brilliant career of Dr. Guay has allowed for the progression of knowledge in the domain of PTSD, social support, as well as in violence. His research work highlights the importance of taking into account the role of social support in the development and maintenance of PTSD and other diverse conditions.



The CET now publishes its own magazine in French: *Traumag*.

Le Centre d'étude sur le trauma (CET)

Co-Directed by Drs. Stéphane Guay and André Marchand, the CET is part of Fernand-Séguin Research Centre at Louis-H. Lafontaine Hospital. It is a place where research, clinical, and multidisciplinary learning occurs in dedication to the problems surrounding trauma. It relies on the collaborations among researchers and interveners from the fields of psychology, psychiatry, criminology, neurobiology, and occupational health. This centre is one of kind in Quebec. Its mission is to develop and to advance knowledge on the evaluation and treatment of post-traumatic stress states.



Les troubles liés aux événements traumatiques: dépistage, évaluation et traitements (English translation: Troubles linked to traumatic events: screening, evaluation and treatments)

Traumatic events provoke psychological problems that can carry long-term repercussions on an individual's mental health: stress, anxiety, substance abuse, depression, sleep problems, etc. This French book summarizes the state of research on the epidemiology of mental illness, presents a synthesis of factors explaining phenomena in the post-traumatic state and exhibits pertinent psychological and biological models. Different methods are proposed for screening, evaluation and treatments that permit specialists to effectively intervene among victims. Up to now, no other piece of French work has addressed such a comprehensive analyses of phenomena related to psychological trauma.

The Best Treatments for Post-traumatic Stress Disorder

Suzie Bond, Ph.D.

Translation: Shireen Sindi

Have you experienced a turbulent event and you are having difficulty returning to a normal life? If you feel that you are on guard, that you involuntarily relive events and that you try, with no success, to stop thinking about it, it is possible that you have developed post-traumatic stress disorder (PTSD). It is important to consult with a mental health professional without delay. After an extensive evaluation, this may confirm that PTSD is the source of your difficulties and may offer you a personalized treatment plan.

GOOD TO KNOW...

Which types of events are associated with post-traumatic stress disorder?

PTSD develops following an event when one was afraid of dying or being severely injured or when one has suffered from severe injuries. Having witnessed a death or serious injuries of another person is equally considered a traumatic event. Here are a few examples of traumatic events:

- Natural disasters: tsunamis, hurricane, mudslide, flood;
- Accidents: drowning, electrocution, severe burns, car or work-related accident;
- Physical or sexual aggression, domestic violence;
- Military combat, war-related situations;
- Death threats.

When should I seek help?

It is perfectly normal to have more or less intense reactions during the days following a traumatic event. Most people report being nervous, having difficulty sleeping and concentrating and a tendency to relive the event (flashbacks, nightmares and intrusive memories). When these reactions are maintained for **several weeks** and are accompanied with attempts to avoid the thoughts, conversations or situations that can serve as a reminder of the trauma, you have probably developed PTSD. Even though difficulties associated with this dis-

order may progressively decrease, they generally have a tendency to persist with time, and can even last for years or for the rest of one's life. Yet, approximately ten sessions with a qualified professional can gradually allow one to return to normal functioning.

I have experienced a traumatic event more than 20 years ago, is it too late to seek help?

There is no time limit to receive help after experiencing a traumatic event. This being said, it is possible that more sessions will be needed in order to benefit from the treatment.

WHAT ARE THE TREATMENT OPTIONS AVAILABLE TO ME?

Fortunately, there are several effective treatments to help individuals with PTSD. They are generally divided into two main categories: psychological interventions and medications.

1) Psychological Interventions

Cognitive Behavioral Therapy focused on Trauma (CBT-T)

To date, CBT-T represents the best choice for the treatment of PTSD. Its effectiveness has been demonstrated numerous times thanks to dozens of studies conducted in different countries. This therapy aims to dampen the memory of the trauma and allow the individual to calmly talk about what had happened and to think about it without being distressed. One of the intervention's main goals is to allow the individual to gradually return to activities associated with the trauma (for example walking on the same street where one has been hit by a car), while decreasing the discomfort experienced when facing these situations. The psychotherapist helps the client to gradually confront the distressing memories and stressful situations by conducting exercises during the session, which are then performed daily at home. Additionally, CBT-T allows the traumatized victim to understand the significance of his/her reactions, to better manage his/her

anxiety and to work on emotions associated with the event, such as guilt, shame and anger.

Generally speaking, psychotherapy requires approximately 8 to 15 individual sessions with a duration of 60 to 90 minutes, once a week. It may be necessary to prolong the therapy if several difficulties are added to the PTSD (for example, depression, problems related to alcohol or drug consumption, or chronic pain). Good news: the improvement achieved thanks to CBT-T is maintained for many years after the end of the intervention, probably for the rest of one's life.

EMDR

In recent years, EMDR (Eye Movement Desensitization and Reprocessing) has been recognized as a new form of psychotherapy that is effective for treating PTSD. Even though EMDR has several similar features to CBT-T (information regarding post-traumatic reactions, anxiety management, returning to the traumatic memory), this therapy is particular in that

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it also stimulates the senses (sight, hearing, touch) as a principal tool for change. During a typical session, the therapist encourages the client to rethink about his/her trauma while his/her eyes are following the movement of a finger (or an object similar to a drumstick), which moves from right to left. Even though this form of therapy has been shown to be useful for treating PTSD, its mechanism of action still remains to be elucidated.

Other forms of therapy

At present, there is no proof for the efficacy related to other forms of psychological interventions such as psychodynamic therapy or hypnosis, which does not exclude the possibility that these alternative treatments can be helpful. This being said, research has clearly shown that therapies uniquely based on relaxation techniques or social support do not lead to durable changes associated with PTSD-related difficulties.

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The Best Treatments for Post-traumatic Stress Disorder

2) Medication

Numerous victims of PTSD take medications prescribed by their doctors. Certain medications such as Paroxetine (for example, PAXIL®), Sertaline (for example ZOLOFT®) and Venlafaxine (for example EFFEXOR®) have been shown to be effective in decreasing post-traumatic symptoms. For certain individuals, medications may offer a bit of extra help to allow them to return to a normal life.

Nevertheless, it should be known that, generally, the improvement associated with medication usage (on its own) is inferior to that produced by psychotherapy. Additionally, patients need to continue taking the medication to maintain the improvement and discontinuing the treatment increases the risk for relapse.

Even if the psychotherapist focusing on the trauma uses the most effective methods to treat PTSD, medications can comprise several advantages that should not be disregarded. One the one hand, it is more easily accessible, costs less and requires less time than psychotherapy. Medications represent an interesting alternative if you do not have access to psychotherapy or if, for personal reasons, you prefer to not be involved in it. On the other hand, medications can help in (temporarily) leveraging symptoms to help the trauma victim engage in psychotherapy if his/her very intense trauma symptoms are preventing him/her from doing so (for example, when their state of alertness is extreme, or their state of anxiety is intrusive). In the presence of a major depressive episode, antidepressants can ameliorate one's mood and help to gather the energy necessary to start psychotherapy.

In conclusion, talk about it to your doctor. He/she may be able to help you choose the most appropriate form of therapy for your difficulty.

AVAILABLE RESOURCES

In Quebec, we have two main providers of psychological services: professionals of the public health sector and psychologists who have their own private practice. Each sector has its advantages and some inconvenient features. Table 1 may help you choose the option that is most appropriate for you.

Few psychologists who are specialized in treating trauma work in the health network (or public health sector). Consequently, access to such services remains limited and the waiting lists are very long. If you can afford the costs of private consultation, this is a better option. It is noteworthy that paying authorities such as the CSST, the IVAC or the SAAQ refund the cost of private sessions if the consultation is connected to your personal file.

The treatment of PTSD in a research centre: an interesting alternative

Table 1 presents a third option, which is treatment in a research centre. It is a very interesting alternative as you may benefit quite rapidly from interventions, free of cost, with individuals who are qualified to carry out interventions. You can be reassured that the forms of treatment offered are among the most recommended ones (see the section below). The Centre d'étude sur le trauma is renown for offering excellent services and high quality care. You may contact the researcher coordinator at: 514 251- 4015 extension 3574.

How to find a qualified therapist?

Ensure that the professional is authorized to provide psychotherapy – In Quebec, only psychologists with extended training in psychotherapy are qualified to treat. A new law will soon allow other health professionals such as nurses, occupational therapists and social workers to become psychotherapists, on the condition that they first obtain a license issued by the l'Ordre des psychologues du Québec (OPQ). It is essential to verify if the professional you are consulting with is officially recognized by the OPQ. In order to do so, you may simply refer to the directory at the following address: www.ordrepsy.qc.ca or call 514 738-1881. Finally, it is worth knowing that physicians are equally authorized to perform psychotherapy with their patients.

Ensure that the professional has had training specialized in the treatment of PTSD – In order to maximize your chance of benefiting from psychotherapy, ensure that you find a professional who is adequately trained to evaluate and treat PTSD, regardless of whether he/she is a psychologist, a physician or another health professional. It is important to know that at the present moment, a person who carries out the intervention may claim to be a specialist in treating trauma, even if this is not truly the case. Do not hesitate to question the professional that you contact (for example, which type of treatment does he/she offer for PTSD). The clarity of explanations provided will help you decide if he/she merits your trust. 🐼

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TABLE 1. Characteristics of psychological services as a function of the sector of consultation.

	PUBLIC NETWORK	PRIVATE CLINIC	RESEARCH CENTRE
Access to service	Difficult	Easy	Depends on the inclusion criteria of ongoing studies
Steps to be taken	The client goes to a CLSC or asks his/her doctor	The client directly calls the professional or the clinic to schedule appointment	The client calls the research coordinator
Waiting time	Long, sometimes for more than a year	Rare	None
Choice of therapist	Difficult	The client has a choice	Difficult
Number of sessions	Varies depending on the location	According to needs	Often fixed
Level of specialization regarding the treatment of trauma	Varies depending on the location	Varies depending on the therapist	Hight
Price	Free of charge	\$80-\$120 / per hour	Free of charge

Were You the Victim of a Criminal Act? Here Are Services to Meet Your Needs!

Isabel Fortin in collaboration with CAVAC of Montreal

Translation: Robert-Paul Juster

According to the 2009 General Social Survey on Victimization, slightly little more than one fourth of Canadians ages 15 and over declared being victims of criminal acts over the course of 12 months prior to responding to the study. While the majority of events were without violence, there remain nearly 30% of reported incidents that do indeed involve violence. Criminal victimization can engender diverse physical, psychological, financial, social, and existential consequences as much for the victim themselves as those close to them and even to bystanders witnessing the event. Consequently, individual exposed to criminal acts are more susceptible to feeling overwhelmed and need to find strategies optimally suited to help them adequately cope with the situation.

Individual exposed to criminal acts are more susceptible to feeling overwhelmed and need to find strategies optimally suited to help them adequately cope with the situation.

What is the Crime Victims Assistance Centre?

Among the organizations that exist to help best support victims of crimes is the Crime Victims Assistance Centre (CAVAC). CAVAC offers specialized services for all victimized individuals or witnesses of criminal acts or those close to them. The help of CAVAC is available regardless of whether the culprit has been identified or not, arrested, prosecuted, or found guilty. CAVAC works diligently as well in collaboration with interveners from the judicial system, health networks, social services, and community organizations. The approach taken by CAVAC towards victims is employed in respect of their needs and their pace. CAVAC is committed to helping victims manage their lives and to guide them in making important decisions. In 2010-2011, the CAVAC network helped more than 65 000 people throughout Quebec. CAVAC's services are free and confidential and consist of, among other, post-traumatic and "psycho-socio-judicial"

interventions, information of rights and recourses, accompaniment, and guided orientation towards specialized services.

Everyone is different

Given the fact that every individual is different and no two experiences are exactly alike, it is utterly impossible to establish what are the "normal" needs of individuals following victimization. This being said, the majority of victims are initially in shock, confused, and often completely destabilized in the first hours following a traumatic event. At this moment, some will seek solitude in order to "digest" what has just happened, while others will wish to speak to someone or to several people in their entourage. When those close to a victim are unavailable or are not in the measure to help meet the needs of the victim, it can be important to seek services offering this support. In this regard, CAVAC offers services that include immediate psychosocial interventions. Complimentarily to the work of the police, those involved in provid-

ing this service can support (either by telephone or in person) victims immediately within the first hours following situations involving criminal acts.

Following the event

Over the first few months following a traumatic event, stress-related reactions are quite common, although generally only temporary for the majority of victimized individuals. Nevertheless, it is possible that victims will need supportive help - let it be from their social network or from professionals - so that they can move on from the nightmarish consequences that often follow such events. In fact, according to the results of an American study, about 75% of victims of criminal acts need emotional and psychological support following a traumatic event. It is therefore for this reason that organizations like CAVAC offer victims different services and interventions via telephone, individual psychosocial or post-traumatic interventions as well as group support systems. Among others, about 50% of victims report a strong need to obtain information. Unfortunately, the particularities and specifics of this type of information are rarely known to those in the entourage of the victim. The expertise of the CAVAC is particularly well developed to answer specific questions. As an example, the themes the most frequently discussed when a person contacts CAVAC for information are the following: 1) what services CAVAC offers; 2) criminal judicial procedures; 3) police inquiries and 4) the resource networks. Finally, about 25% of victims state the need to have tangible help with the in-



CAVAC offers specialized services for all victimized individuals or witnesses of criminal acts or those close to them. The help of CAVAC is available regardless of whether the culprit has been identified or not, arrested, prosecuted, or found guilty. CAVAC works diligently as well in collaboration with interveners from the judicial system, health networks, social services, and community organizations. The approach taken by CAVAC towards victims is employed in respect of their needs and their pace. CAVAC is committed to helping victims manage their lives and to guide them in making important decisions.

Were You the Victim of a Criminal Act? Here Are Services to Meet Your Needs!

stallation of security systems or the replacement of damaged ones.

For some victims, another form of tangible support is the possibility of obtaining compensation from the Direction de l'indemnisation des victimes d'actes criminels (IVAC; English translation is Direction of compensation for victims of criminal acts). Victims can also benefit from some financial support, measures to facilitate physical and social re-adaptation, and even participation in professional re-adaptation programs. In fact, CAVAC offers technical assistance so that victims are able to complete different forms in respect of the formalities inherent to their situation. In addition, when the victim's needs surpass CAVAC's mandate, personnel can guide victims towards other specialized services.

It will pass! Really?

For some, once the first week has passed, the person's level of functioning returns to its initial state prior to the event. Others will only regain partial functioning or develop intense and chronic reactions (for example: flashbacks, persistent avoidance of event's location, hyper-vigilance). Among

victims of violent crimes, statistics reveal that approximately 20% to 40% develop a state of post-traumatic stress, while 30% will experience sleep problems and 15% will suffer from depression. If the person's habitual functioning is still altered several months after the event, it is imperative to seek formal help services (for example, a specialized psychologist). CAVAC's services can also provide this type of support for victims. The difficulties engendered by victimization can also be put into perspective upon completion of an evaluation, since this can establish the means to counter these difficulties and regain an improved quality of life.

And what about judicial procedures in all of this?

One of the unique particularities for victims of criminal acts is the possible implication for representatives of the law. Participation in judicial procedures can have beneficial effects: for instance, one can obtain a certain level of personal "mending" or sense of justice, one may feel the experience of victimization is formally recognized and validated as well as reinforced and regain feelings of security. This being said, the whole protocol of judicial procedures can be as much a facilitator of

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re-establishment of oneself as it can be a factor that can aggravate consequences stemming from the initial trauma even further. In effect, victims generally experience tremendous levels of anxiety at the prospect of testifying in a court of law, as much as at the point of complaint as the whole process. For these reasons alone, it is important for victims to be accompanied throughout the whole proceedings by either someone close to them or by a CAVAC intervener.

In sum, the potential needs among victims or witnesses of criminal acts as well as those close to them are varied and can be beyond the capacities and knowledge of their entourage. In these instances, it can be useful to contact CAVAC since they offer services adapted to the needs of the situation. *RP*

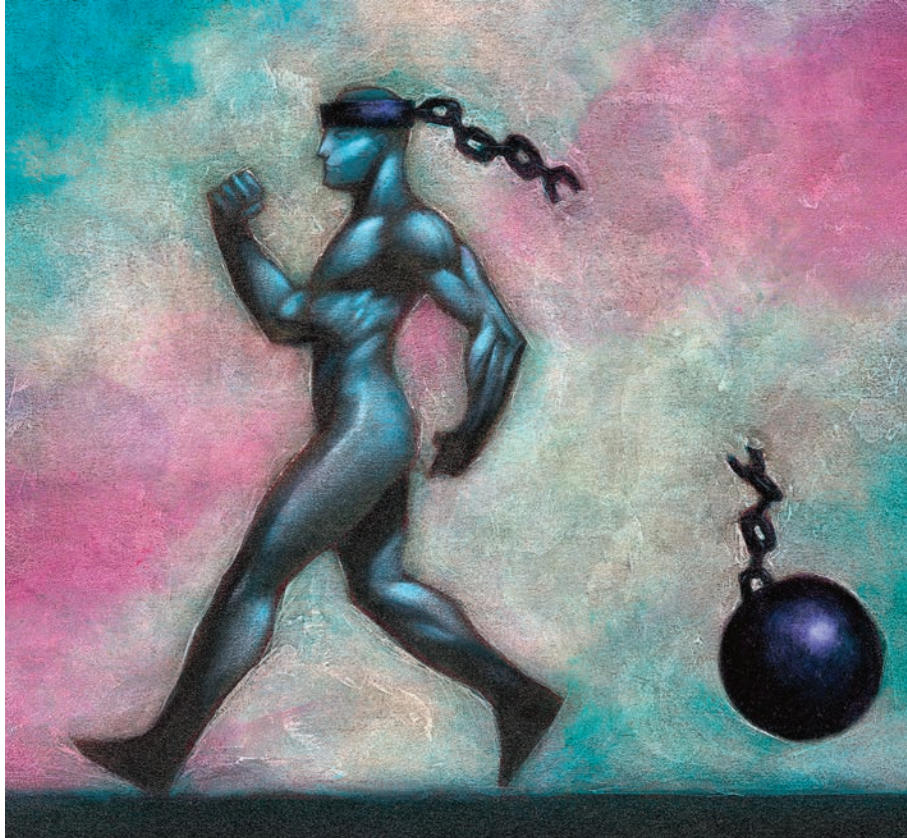


Part of the poster of the movie *Incendies* by Denis Villeneuve.

Can we Neutralize Traumatic Memories?

Marie-France Marin

In collaboration with Sonia Lupien, Ph.D.



Everyday, researchers work on different studies in the aims of obtaining answers to their numerous questions. One thing that all of them have in common is the desire to generate new knowledge that will eventually serve society in some way. Obviously, from an external point of view, it is sometimes difficult to conceptualize how some studies could have a direct application to daily life. It is essential to understand that research is being conducted at different levels: from genetics to clinical populations, without neglecting cellular, animal and human studies. Most of the time, these are not isolated but rather complementary since all the different degrees of analyses influence each other.

Research on post-traumatic stress disorder (PTSD) does not differ from other domains. In fact, the studies that I have conducted for my doctoral degree at the Centre for Studies on Human Stress under the supervision of Dr. Sonia Lupien are examples of this translational research. We aimed to apply knowledge from the animal research to healthy human subjects in order to de-

termine whether this could eventually be useful for a clinical population. One finding relates to the mechanism by which the brain creates a memory of a traumatic event, a memory that is involved in the development of PTSD.

How does a memory get formed in our brain?

Pioneer animal studies have first demonstrated that memory is a dynamic phenomenon where the newly learned information is first unstable in the short-term memory system. Then, this information stabilizes in the long-term memory system, a phenomenon called 'memory consolidation'.

Consolidation, which acts by transforming a short-term memory (unstable memory) into a long-term memory (stable memory), is analogous to burning a CD. When we want to burn a CD, we first select information that we want to put on the CD and we then start the process allowing burning information. Once the information is burned on

the CD, it will never disappear; this information is thus consolidated. However, if a power shutdown occurs while the computer is burning the CD, very little information will end up on the CD. The same process applies to our memory. If there is interference while our brain attempts to consolidate some information (for example, someone intercepts us to talk or our phone rings), this information will not be well consolidated and will not be adequately burned in our long-term memory system. However, sometimes some information is burned in our brain in a more important manner than other information.

This is exactly what happens with memories of traumatic events. When our brain detects information that could affect our survival or that frighten us, this information becomes 'hyper-consolidated', and is burned very deeply in our brain. And this is because traumatic memories are better consolidated that they could lead to a PTSD. Thus, every time a person who has been exposed to trauma faces events that are somewhat similar to the previous trauma, this brings back to consciousness the hyper-consolidated traumatic memory, which prevents the good functioning of the individual. It is like living the same event day after day and this, because of the hyper-consolidated memory.

Can we prevent the formation and consolidation of traumatic memories?

When researchers have studied the mechanisms by which memories are consolidated, they have learned that the administration of certain pharmacological treatments (drugs affecting memories) or environmental interventions (for example, exposure to a stressor) in the minutes following the initial learning can modulate this memory trace. Thus, administration of amnesic drugs prevents the memory consolidation whereas stress exposure usually increases memory consolidation.

Consequently, some studies have tried to decrease the risks of developing a PTSD by administering various compounds **immediately** after a trauma with the aim of decreasing the consolidation of this traumatic memory. By administering an amnesic drug immediately after a trauma, we could theoretically prevent the memory formation of this traumatic event and thus, help people to not develop PTSD. However, although the results of these studies are encouraging, in practice, it is very difficult to administer these amnesic drugs **immediately** after trauma exposure. For example, rape victims do not always report the event to which they have been exposed, or soldiers in mission need to remain on the battlefield after trauma exposure. Thus, although these study domains are in expansion, the reality of the situations renders difficult the application of this knowledge to the clinical field.

Can we neutralize already formed and consolidated traumatic memories?

For many years, we thought that it was impossible to modify a memory trace once its consolidation was over. In fact, it is impossible to burn information on a CD that is already burned. Once the CD is burned, the information is stable on it and cannot be modified.

However, in the early 2000s, some research groups were inspired by a study published in 1968 that has somehow been forgotten. This study demonstrated that the recall of a memory brings it back to the short-term memory system, where it becomes unstable once again. So, by reactivating a memory (i.e. by recalling), we can consolidate it a second time (reconsolidation) and this, in a different manner than the first round of consolidation. This is analogous to the fish that gets bigger every time the fisherman tells his story.

By demonstrating that a reactivated memory can be reconsolidated in a slightly different manner, researchers have tried to elucidate whether administration of amnesic treatment following the recall (reactivation) of a memory can modulate it before it re-stabilizes in the long-term memory system. If this were the case, it would then be possible to ask someone to recall a past traumatic event. This recall would allow the memory to be reactivated and at this moment, it would be possible to administer some pharmacological agents that would allow to decrease the reconsolidation of this traumatic memory trace, leading to the neutralization of this latter.

This theory, that has been termed memory reconsolidation, has somewhat revolutionized this research domain. A keen interest has rapidly emerged regarding the potential implications of this theory for trauma victims.

This theory, that has been termed *memory reconsolidation*, has somewhat revolutionized this research domain. A keen interest has rapidly emerged regarding the potential implications of this theory for trauma victims. In fact, given that memories of traumatic events seem over consolidated in people suffering from PTSD, we can think that the reactivation of this bad memory could open up a window of opportunity for the administration of a given treatment that would decrease this memory trace in a long-lasting manner.

From animal to human

However, all the previously cited studies were performed on animals and it was thus necessary to verify whether these animal findings could also

apply to human populations. In fact, between the animal research and the application to a clinical population suffering from PTSD, some steps must be taken. First, it is essential to understand the mechanism by which this reactivated memory can be modified in healthy humans who have not been exposed to a traumatic event. Given that stress hormones are known to be important modulators of memory consolidation, especially for emotional memories, we investigated the role of stress hormones on the reactivation of a consolidated memory.

Stress can deeply burn traumatic memories

We have thus conducted a first study in 32 healthy participants aged between 18 and 35 years old. With the aim of mimicking a negative event, we have first exposed all of the participants to a slideshow that consisted of neutral and negative scenes. Once the viewing was completed, participants were asked to come back for a second visit two days later. This delay of two days allowed the memory of the neutral and negative scenes to be consolidated. Upon the second visit, we have asked the participants to recall the slideshow seen two days ago. This acts to reactivate the already consolidated memory trace of the neutral and negative scenes. Following this, we exposed half of the participants to a psychosocial stressor whereas the remaining participants were asked to read magazines (control group). We then tested their memory performance for the slideshow immediately after the stressor (or the reading) as well as five days later.

Our results demonstrated that the stress-exposed group had higher stress hormone levels and an increased memory performance for the negative elements of the story immediately after the stress procedure, compared to the control group. Moreover, this potentiated memory for the negative elements was still observed five days later. This suggests that stress exposure, upon reactivation of a negative memory, increases this memory trace in a long-lasting manner (see **Figure 1**).

These results have allowed demonstrating that when a negative memory is reactivated and that the individual is then exposed to a stressor, the produced stress hormones lead to a hyper-reconsolidation of the negative memory.

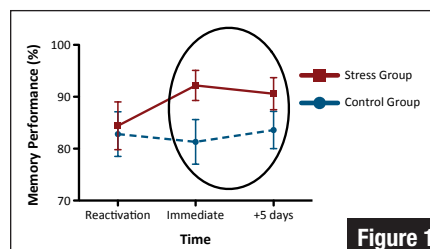


Figure 1

Any reactivation of a traumatic event can lead to an increase of the memory trace if this happens in a stressful context. It is essential to make sure that the recall of traumatic events occurs in contexts that are not stressful for these individuals who have the heavy burden to recall these painful events.

Implications for trauma victims

The results of this first study are very important for trauma victims because they suggest that any reactivation of a traumatic event can lead to an increase of the memory trace if this happens in a stressful context. Often, following traumatic events, psychologists are sent to assist the victims in order to allow them to talk and vent about the traumatic event. This method is called 'psychological debriefing'. If trauma victims recall traumatic memories, this will reactivate the memory trace. If after this reactivation induced by the psychological debriefing, victims are exposed to a stressor (interview with a journalist, a police officer, talk with the family who is in crisis, etc.), this could increase the reconsolidation of the traumatic event instead of neutralizing it. Thus, without wanting it, we could burn even more strongly the traumatic memory. On the basis of these results, it is thus important to make sure that the contexts of therapy are optimal for the trauma victim to whom we ask to recall the traumatic event. It is essential to make sure that the recall of traumatic events occurs in contexts that are not stressful for these individuals who have the heavy burden to recall these painful events, because if the recall occurs in a stressful context, the traumatic memory could be burned more deeply than if no intervention would have been made.

Decreasing stress hormones for neutralizing traumatic memories?

If stress hormones increase traumatic memories, can we obtain the opposite result, that is, would decreasing stress hormones levels lead to the neutralization of traumatic memories? We aimed to answer this question by performing a second study in which we have tried to elucidate whether a decrease in stress hormone levels, at the time of memory reactivation, would decrease the reconsolidation of negative memories. In order to diminish the levels of the stress hormone cortisol, we used a compound called metyrapone, which prevents the production of stress hormones. We recruited 33 healthy men between 18 and 35 years old and we exposed all of them to the same slideshow previously described. Three days later (after the consolidation of the slideshow), participants came back to the lab and were randomly divided into three groups: a first group received a weak dose of metyrapone, a second group received a

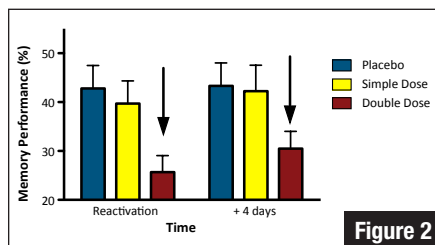


Figure 2

strong dose of metyrapone and a third group received a placebo (no active substance in the tablet). Following the administration of metyrapone or placebo, all participants were asked to recall the slideshow (reactivation). Another recall test was performed four days later.

Our results showed that the participants who received the strong dose of metyrapone recalled less negative elements of the story seen 3 days earlier in comparison to the other groups. Four days later, when cortisol levels were back to normal for all three groups, this memory deficit was still present in the group that received the strong dose of metyrapone (see **Figure 2**). Once again, no effect was observed for the neutral elements.

The results of this study demonstrate that decreasing stress hormone levels at the time of recalling a memory can decrease negative memories in a lasting manner.

Implications for trauma victims

Clearly, these results are promising and represent a certain hope for people suffering from PTSD.

However, it is important to remain careful and to avoid jumping too rapidly to any conclusions. In fact, major challenges continue to pave the way of researchers attempting to neutralize traumatic memories in individuals suffering from PTSD.

First, metyrapone – which is a drug that was used to diagnose endocrine problems and that was not thought to have the capacity to modulate traumatic memories – is no longer approved in Canada and so, the pharmaceutical company that has created it can no longer provide it to us for research purposes. It is thus impossible to pursue our studies on the potentially therapeutic effects of metyrapone on the neutralization of traumatic memories. However, other pharmacological substances are also efficient at decreasing stress hormone levels (for example, dexamethasone), but their mechanisms of action are different than metyrapone. So, researchers would need to determine whether these other compounds could neutralize traumatic memories with the same efficacy as metyrapone.

Second, our studies were performed in participants who did not suffer from PTSD and so, we need to pursue our experiences to determine whether the pharmacological substances decreasing stress hormones can neutralize traumatic memories in PTSD victims. In fact, we have created and neutralized negative memories (as described in our slideshow), but a traumatic memory could be burned in a deeper manner in the brain than a simple negative memory. It is possible to believe that the pharmacological substances decreasing stress hormones could not neutralize these hyper-consolidated memories. It is thus necessary to

duplicate our results in a clinical population of individuals suffering from PTSD.

Finally, before we can realize these studies in PTSD victims, other studies must be performed in healthy human participants with the aim of elucidating further the mechanism by which stress hormones can modulate already acquired memories. For example, we are currently analyzing another study that aimed to determine whether all types of memories, including our personal negative and positive memories, are modifiable by stress. After all, our previous studies are based on an artificial memory that we created in laboratory. However, if we want to help people suffering of PTSD, it is essential to examine whether our personal memories, called 'autobiographical memories', are also sensitive to the modulation of stress hormone levels at the time of their recall.

Conclusion

This line of research needs to be pursued and we will make sure to keep you updated with our new results in the next issues of the Mammoth Magazine. Until then, on the basis of our results, the rule to follow is avoiding stress exposure when we recall a traumatic event, because the produced stress hormones could act by burning more deeply the traumatic memory in our brain.

As you can see in the box below, our next Mammoth Magazine will be on the methods to counter a stress response. So, stay with us and you will learn how to negotiate your stressors before they can trick your memory! 🧠

Here are a couple of scientific articles that we made reference to and various references and works that may interest you:

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New Web Site

We are pleased to announce that the new Centre for Studies on Human Stress website is up and running.

We invite you to come and surf our improved site.

Among other things, you will find:

- a whole array of information on stress
- information for specific populations (the stress of parents, of youths, of elders, of workers, etc.)
- all issues of our *Mammoth Magazine* (freely downloadable)
- a FAQ section with videos where experts respond to your questions regarding stress and mental health
- tools for researchers (upcoming conferences and technical information on stress) information concerning our different educational programs

Come visit us!

www.humanstress.ca



Par amour du stress

Sonia Lupien, Ph.D., Director of the Centre for Studies on Human Stress of Louis-H. Lafontaine Hospital and professor in the Department of Psychiatry at University of Montreal has recently published her first book titled “Par amour du stress” in French only at the moment.

“Contrary to what people think, stress is not a disease: it is essential to human survival”, explains the author who also directs the Fernand-Seguin Research Centre at Louis-H. Lafontaine Hospital. “On the other hand, if you endure chronic stress, this can have dire consequences.”

In this book, Sonia Lupien writes in a simple style full of imagery and with a pinch of humour the combined results of 20 years of scientific studies on stress, its causes, its symptoms, and its long-term consequences on the human body. She proposes surprising methods to control it, which all of us can achieve.



Next Issue

Hans Selye, the father of stress in medicine, once said that the only way to not have stress was to be dead. As an integral part of living that has allowed species to survive, stress is a double-edged sword. But why do some deal with stress so damn well? We call this psychological resilience, the ability to cope and adapt to the stressors of being alive. In our next issue devoted to resilience, we shall explore the scientific evidence surrounding this powerful protection. How do factors like diet, exercise, social support, education, relaxation, and countless others work as de-stressors? While there is no universal solution, there is a vast mixture of elements that can render us more resilient. Join us next issue as we explore the positive side of coping with stress.



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*We wish to mention the collaboration of CAVAC de Montréal

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