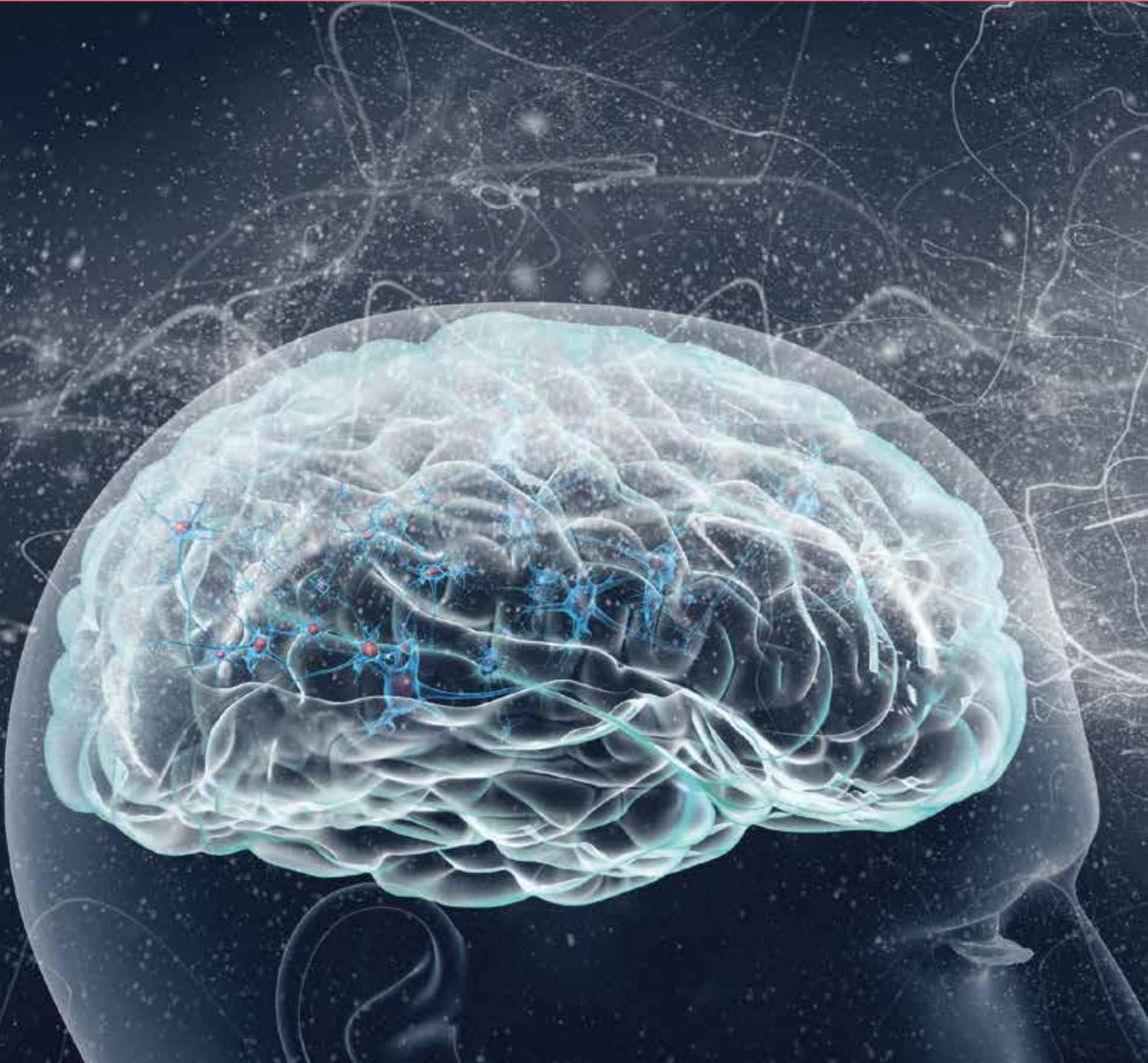
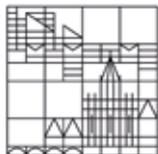


REDEFINING THE MIND



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Redefining the mind

At the University of Konstanz in Germany, the MemoTV team is exploring memories of traumatic stress and violence, shedding new light on malfunctioning and mental suffering and, ultimately, helping those affected by extreme and traumatic stress

War and terrorist actions persist and are becoming frighteningly commonplace. Documented incidents of violence cannot be ignored. It appears a growing number of individuals are turning to extremism, which may be driven by an appeal for violence. As a result, millions of people are being forced to survive inhumane conditions. Both for the perpetrators and the victims, this often has a profound impact on mental health, shaping individuals' futures in a negative cycle of destructive thoughts and behaviours.

A collaboration between several universities and government organisations around the world is seeking to reach the root of the problem and is ultimately striving to have a significant, benevolent impact on humankind. 'Epigenetic, neural and cognitive memories of traumatic stress and violence' (MemoTV), based at the University of Konstanz in Germany, is exploring how stressful experiences shape memories in humans, and imploring researchers and governments to take action. MemoTV consists of four projects spanning four countries over three continents, investigating the psychological, neurological and biological underpinnings and sequelae of traumatic events.

A COMPASSIONATE TEAM

MemoTV, which is an EU Seventh Framework Programme (FP7) project funded by an advanced grant from the European Research Council (ERC), is headed up by Principal Investigator Dr Thomas Elbert, Professor of Clinical Psychology and Behavioural Neuroscience at the University of Konstanz, and Project Coordinator Danie Meyer-Parlapanis MSC, a doctoral student supervised by Elbert's prestigious leadership. Elbert has extensive experience working with members of organised violence, refugees and former child soldiers, and is excellently placed to continue to make headway in these areas.

Elbert has worked for decades with traumatised survivors of severe human rights violations and, alongside Dr Maggie Schauer, together with Frank Neuner now at Bielefeld University in Germany, has developed narrative exposure therapy (NET), which is a treatment for trauma that is specifically designed for survivors of organised and domestic violence. Although – by his own admission – the therapy is considered controversial by some, Elbert believes getting to the root of the issue within perpetrators is key to understanding and preventing the problem. 'The more we worked in Northern Uganda with the survivors of the Lord's Resistance Army (LRA) terror, the line between victim and perpetrator began to dissolve,' explains Elbert. 'As psychologists we stopped asking whom to blame, but were wondering how killers and murderers are made – can everybody be turned into a criminal? What are the mechanisms?'

QUESTIONS WITH DIFFICULT ANSWERS

The project will ultimately span five years and is currently at its mid-point. Combining innovation with passion, the team has already demonstrated international leadership and expertise in fieldwork in war-torn crisis regions. The project is unique in its approach, seeking to redefine the mind and its functional brain organisation as interactive processes in human experiences. The key question the team is asking is: 'How do stressful experiences shape and organise memories in humans?'

Elbert's team is investigating the mechanisms by which these experiences shape memories on epigenetic, neural and cognitive levels and looking at how these memories interact with cultural settings to cause mental suffering. The goal behind this is to identify the mechanisms that produce lasting changes in how the brain is organised and functions – maladaptive plasticity. If they can do this, the researchers can potentially prevent and reverse the

consequences. The project employs the novel method of 'epigenome-wide association studies' (EWAS) in order to determine DNA methylation and discover a trait of interest.

The work builds on the knowledge that frequent exposure to severe stressors reorganises how the brain functions and does so in a lasting and self-perpetuating way, so that a corresponding stage of what is called the defence cascade can become activated by even small, subtle prompts. The team is exploring these mechanisms in a range of people and contexts, namely a German trauma clinic, Rio de Janeiro's favelas, the townships of South Africa and a Burundian peace corps. 'What we see in refugees and survivors of war and terror is representative of humans at large,' Elbert explains.

STRESSED AND REORGANISED

A primary focus is on chronic and traumatic stressors that people experience in war and crisis situations, as combat and military actions are known to increase the risk of developing trauma-related mental illness. Also, the variability is high, which enables them to systematically explore the consequences of stress, which can then teach them about, and be applied to, the rest of the population. 'I think this makes our team unique,' Elbert reflects. 'Few have the privilege to integrate knowledge from both of these settings and to advance and test scientific concepts that hold for both scenarios.'

Stressful situations cause organisms and organs to become reorganised, having an impact on future trajectories. The changes apply to gene expression and can be seen in epigenetic patterns. The team is investigating this by studying maternal stress during pregnancy. 'Animal experiments suggest we might see the largest effects early in development, so we asked if this would be the case



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during pregnancy,’ says Elbert. The team looked at intimate partner violence (IPV) in Brazil, examining the psychiatric and epigenetic consequences of IPV in a human population exposed to high levels of community violence.

They found that though women in this community experiencing IPV suffered from severe mental health complications, their children did not. The children exposed to prenatal IPV experience faster stress recovery than controls, as suggested by the fact the children gained DNA-methylation in normally highly methylated regions and lost methylation in normally poorly methylated regions, which was the opposite for the mothers. ‘Given the complexity of these dynamics, certainly more exciting results are to be expected,’ says Elbert.

BRANCHING OUT

Working with soldiers in Burundi, the team interviewed and collected saliva samples to investigate the impact on their behaviour and mental health of traumatic and violent experiences. They found, with treatment, the likelihood of developing PTSD and/or depression after deployment can be reduced substantially.

Looking ahead, the team wants to expand its research, building on the success they

have had to date: ‘Our approach has helped thousands, but it is needed for millions,’ says Elbert. He explains the main challenge is to sustain their successes, which is challenging due to a lack of funding: ‘We have no funding to continue the excellent work that local agencies have started with former gang members in the townships of Cape Town,’ he reveals. ‘To support criminal offenders is not popular, but it is the way to stop the cycle of violence.’

In order to spread their research, the team has effective contact with the media and Elbert is also an active panel member, for example, for the presidential symposium on the upcoming largest European psychiatry congress. ‘We are tirelessly pushing to make the findings of MemoTV recognised as a priority and resource in today’s flummoxing world of individuals displaced by crisis and war,’ stresses Meyer-Parlapanis.

The team’s results play a vital role in humanitarian efforts in crisis regions. They are hoping to influence a wide range of people and have a profound and lasting impact on opinions, actions and treatment methods, and as such, MemoTV is an innovative, powerful project, and with the team’s resolute efforts, it seems to have every chance of doing so.

Project Insights

FUNDING

German Research Society • European Refugee Fund (ERF) • European Research Council (ERC)

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Burundi:

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Martina Hinsberger

(local partner: Professor Soraya Seedat, University of Stellenbosch, Dr Debbie Kaminer, University of Cape Town)

Brazil:

Dr Fernanda Serpeloni-Henning

(local partner: Professor Simone Assis, National School of Public Health of Rio de Janeiro, Oswaldo Cruz Foundation)

Germany:

The University of Konstanz Centre of Excellence for Psychotraumatology, jointly run by the University of Konstanz and the NGO vivo (<http://www.vivo.org/en/>) • Director: Dr Maggie Schauer

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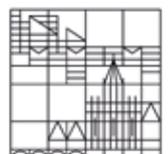
W: http://cordis.europa.eu/project/rcn/109534_en.html

PROJECT LEADER BIOS

Dr Thomas Elbert has been Professor of Clinical Psychology and Behavioural Neuroscience at the University of Konstanz in Germany since 1995. He is also the founding president of the non-profit organisation vivo International (victim’s voice, www.vivo.org).

Danie Meyer-Parlapanis is a doctoral student in Clinical Psychology at the University of Konstanz. To date she has co-authored three publications on Appetitive Aggression, the attraction to proactive forms of aggression.

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Impact Objectives

- Help the many millions of adults and children worldwide affected by extreme and traumatic stress
- Extend the work of MemoTV to new territories and attract other scientists with humanitarian hearts to continue to help those affected by trauma and violence
- Shed light on the root causes of the violence entrenched in communities around the world

Unravelling the origins of trauma

In a bold new project, Dr Thomas Elbert, Danie Meyer-Parlapanis, Dr Maggie Schauer and their team are exploring how mental health, behaviour and the associated phenotypes are altered in response to stressors. They hope their work will lead to a growing humanitarian response to violence



(From left) Danie Meyer-Parlapanis, Dr Thomas Elbert, Dr Maggie Schauer

Can you introduce us to MemoTV and explain how the idea came about?

DMP: MemoTV stands for 'Memories of Traumatic Stress and Violence.' This project was inspired by survivors of extreme conflict and war who described the manner in which their worst experiences are often processed as tantamount to the forced viewing of unwanted, terrifying re-runs, often in fragmented clips. MemoTV was designed to extend beyond the confines of scientific and academic communities to provide tangible, accessible, research-based interventions and resources to crisis stricken populations around the world.

TE: The scientific investigations of MemoTV are implemented with two trajectories: (1) clinical treatment and laboratory investigations of traumatised asylum seekers in Germany, and (2) epidemiological investigations and clinical-therapeutic work in war and crisis regions. Trauma-related mental illness is a consequence of the organisation of memory rather than a typical anxiety disorder caused by fear conditioning alone. We have built on the work of memory researchers to develop our theories about the memory structures for trauma and violence, which is the core of MemoTV.

How does frequent exposure to violence affect the brain and mindset of victims?

TE: Organisms and organ systems alter their phenotypes in response to stressors. Accordingly, the entire organism, including its information processing units – the brain, immune and endocrine systems – are permanently reorganised, not only by the original experiences but also by the memories thereof.

How did you decide on the geographic locations for your work?

TE: The locations selected were regions in which MemoTV team members had close ties and expertise. Previous successful projects in Burundi and South Africa and a doctoral student (now Dr Serpeloni-Henning) from Brazil paved the way for international investigations. The University of Konstanz Center for Psychotraumatology in Germany directed by Dr Maggie Schauer supports the Germany investigations.

What role has your work played in humanitarian efforts in crisis regions?

TE: We have shown how treatment reduces psychopathological symptoms and increases psychological functionality. The latter is especially essential for survival in resource-poor regions lacking welfare systems. For example, there is now a large-scale project supported by the Social Fund of the Democratic Republic of the Congo (DRC) and the World Bank that seeks to treat thousands of survivors of sexual and gender-based violence in the Kivu regions.

Research is still needed for community-based interventions. This will require substantial funding that is unfortunately not presently targeted by European funding schemes.

What are the major concerns about the currently unprecedented number of displaced people?

MS: Modern warfare targets civilians. Nearly one out of 100 people worldwide is on the run. Aggression and deprivation have destructive impacts on mental health, resulting in a psychiatric emergency of pandemic proportions. This mass refugee movement is a mental health crisis, accounting for almost one in three years lived with disability globally. In 2010, the global cost of mental disorders was estimated to be US\$2.5 trillion; by 2030 that figure is projected to go up by 240 per cent, to US\$6 trillion.

Where do you see the project developing in the future?

DMP: We hope MemoTV will attract other scientists to continue the fight for funding and the legwork in the field. Scientists looking to their own communities and collaborating across oceans to identify and address trauma and violence is surely the dynamic response required for success in the future.

