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3rd Newsletter

December 2019

Major steps forward

Watch the DynaMORE project video

Save the dates!

Announcements & Achievements

Highlights from the 5th Resilience Symposium

Most recent DynaMORE publications

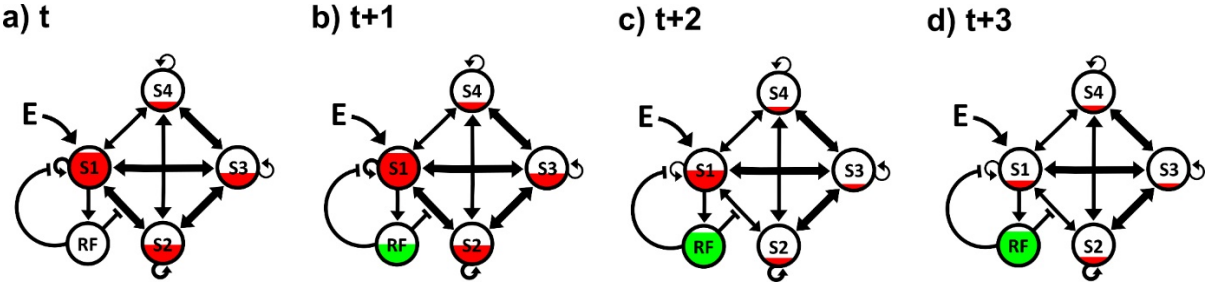
CHRISTMAS: Bake a resilience cookie

Welcome to our 2nd newsletter! **DynaMORE** is an international research project that aims to promote stress resilience and improve mental health and well-being in the face of adversity. It is spearheaded by **Prof. Dr. Raffael Kalisch** from the German Resilience Center (**DRZ**) at the University Medical Center Mainz (**UMC-MAINZ**) and funded by the European **HORIZON 2020** Research and Innovation Programme.

The DynaMORE Steering Committee (SC) just met in Luxembourg on November 25th to discuss the overall progress and first emerging results. Lots of progress made already!

Major steps forward

DynaMORE work packages **WP1, WP2 and WP3** developed a basic theoretical approach to the mathematical modelling of resilience that is based on the conceptualization of stress-related disorders as dynamic networks of interacting symptoms that may be driven by stressors into stable states of disease. Resilience factors are incorporated into these networks as new network nodes, which are able to dampen symptom interactions and prevent the system from transiting into a disease state. Resilience factors themselves can vary over time in their strength (effectiveness). The basic idea is illustrated in Figure 7 of our most recent DynaMORE publication, entitled **"Deconstructing and Reconstructing Resilience: A Dynamic Network Approach"** in *Perspectives on Psychological Science*.

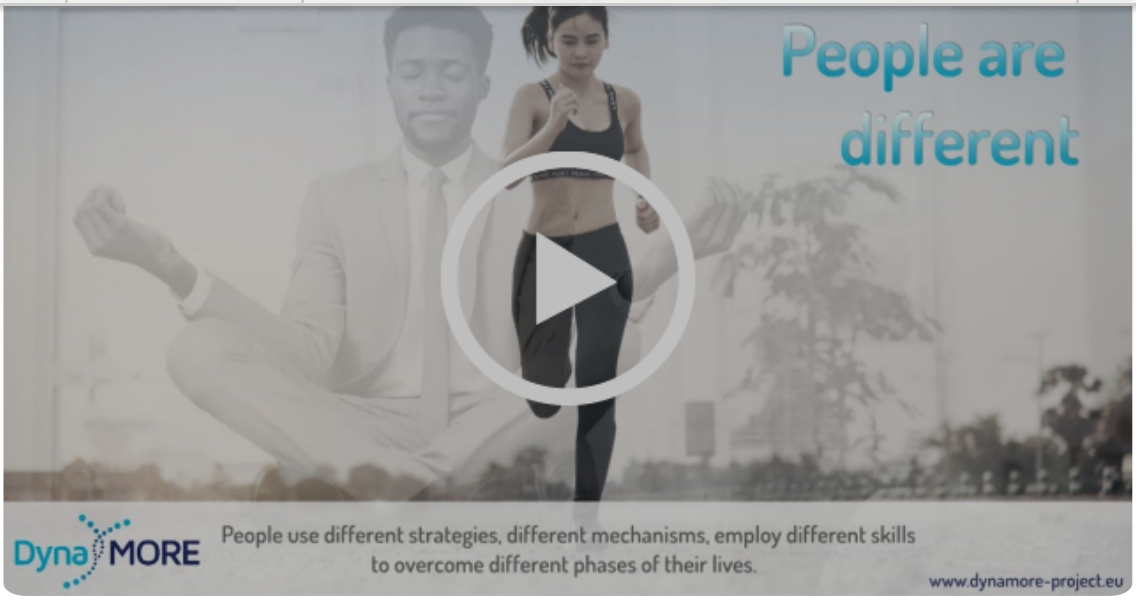


Interaction of stressors and resilience factors: S1 to S4 are stress-related symptoms, S1 is a stressor and RF is a resilience factor. The symptom is the higher, the higher the red filling of the node. Symptom activation spreads across the network from S1 to other symptoms via the symptom interconnections (arrows). Activation spread is limited by the inhibitory connections from the RF to the interconnections. The strength of the RF is indicated by the green filling of the node. Use of an RF may be motivated or strengthened by an aversive emotional state (stress; arrow from S1 to RF). t, time point.

Work packages **WP5 and WP7** have developed a first smartphone app-based intervention that is intended to boost an identified resilience factor, is now being tested for its effectiveness, and will soon be used in a longitudinal multi-center study as a means to causally intervene into the network. This will allow for testing the causal role of the identified factor. Moreover, the study will be a prototype test of a new mHealth application that combines individual characterization, mathematical modelling of baseline and longitudinal assessment data, and – on this basis - personalised, targeted intervention with the aim to prevent stress-related pathology.

Watch the DynaMORE project video

What's **DynaMORE** all about? **Dr. Nina Donner** from **concentris** produced an introductory **project video** in which the project's scientific coordinator, **Prof. Dr. Raffael Kalisch** from the German Resilience Center (**DRZ**) at the **University Medical Center Mainz**, provides an overview of the project's key goals, its methodological approach, and the need for more preventive and personalised strategies in mental healthcare. More video interviews with **DynaMORE** researchers will follow next year!



Save the dates!

10th European Conference on Positive Psychology (ECPP)
24 - 27 June 2020
Reykjavik, Iceland

The theme of the conference is “Creating a world we want to live in”. The conference is a platform to present the latest research and its application within the field of positive psychology. It is a unique opportunity for scholars and practitioners to meet and discuss challenges and opportunities within the field of positive psychology from all over the world. **ECPP 2020** will cover three main aspects of Positive Psychology: Theory and basic research, applied research, and practice.

3rd DynaMORE General Assembly (GA) Meeting
29 April - 1 May 2020
Warsaw, Poland
Contact: **Vanessa Köhler**

Announcements & Achievements

Prof. Dr. Raffael Kalisch's group at **UMC-MAINZ** says thank you to **Dr. Haakon Engen** who will leave the **DynaMORE** project. Haakon has done a fantastic job as a postdoc our project, especially in analysing data, and linking data to the modelling work package (**WP1** and **WP2**), and the clinical and neuroscientific researchers in the project (**WP4**). His commitment and expertise will be greatly missed. Thank you for all your great work, Haakon!

A **new PhD position** is currently open at **Charité** in Berlin! The start date is 1 April 2020. Click below for details regarding the exciting position on the DynaMORE project. Note: The position requires German language skills at level C1.

DM.241.19 Promotionsstelle in Resilienz-Studie (Psychiatrie/Neurowissenschaften)

12.11.2019
Forschung und Wissenschaft
Berufseinsteiger
Bewerbungsfrist 15.12.2019

Klinik für Psychiatrie und Psychotherapie CCM – CCM

CHARITÉ UNIVERSITÄTSMEDIZIN BERLIN

Neurologie, Neurochirurgie und Psychiatrie (CC 15)

Congrats to **Dr. Carolin Wackerhagen** who successfully defended her dissertation *summa cum laude at* the **Charité** in Berlin! Together with Dr. Ilya Veer, Prof. Henrik Walter, and other collaborators, she published her dissertation work about neural markers of the pathogenesis of depression, entitled **"Amygdala functional connectivity in major depression – disentangling markers of pathology, risk and resilience"**, in the journal *Psychological Medicine* in September 2019. By comparing patients, individuals at risk, and controls, they were able to distinguish potential markers of pathology, risk, and resilience.

Psychological Medicine

cambridge.org/psm

Original Article

Cite this article: Wackerhagen C *et al* (2019). Amygdala functional connectivity in major depression – disentangling markers of pathology, risk and resilience. *Psychological Medicine* 1–11. https://doi.org/10.1017/S0033291719002885

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Key words:
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Amygdala functional connectivity in major depression – disentangling markers of pathology, risk and resilience

Carolin Wackerhagen[1], Ilya M. Veer[1], Susanne Erk[1], Sebastian Mohnke[1], Tristram A. Lett[1,2], Torsten Wüstenberg[1], Nina Y. Romanczuk-Seiferth[1], Kristina Schwarz[3], Janina I. Schweiger[3], Heike Tost[3], Andreas Meyer-Lindenberg[3], Andreas Heinz[1] and Henrik Walter[1]

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Abstract

Background. Limbic-cortical imbalance is an established model for the neurobiology of major depressive disorder (MDD), but imaging genetics studies have been contradicting regarding potential risk and resilience mechanisms. Here, we re-assessed previously reported limbic-cortical alterations between MDD relatives and controls in combination with a newly acquired sample of MDD patients and controls, to disentangle pathology, risk, and resilience.

Methods. We analyzed functional magnetic resonance imaging data and negative affectivity (NA) of MDD patients ($n = 48$), unaffected first-degree relatives of MDD patients ($n = 49$) and controls ($n = 109$) who performed a faces matching task. Brain response and task-dependent amygdala functional connectivity (FC) were compared between groups and assessed for associations with NA.

Results. Groups did not differ in task-related brain activation but activation in the superior frontal gyrus (SFG) was inversely correlated with NA in patients and controls. Pathology was associated with task-independent decreases of amygdala FC with regions of the default mode network (DMN) and decreased amygdala FC with the medial frontal gyrus during faces matching, potentially reflecting a task-independent DMN predominance and a limbic-cortical disintegration during faces processing in MDD. Risk was associated with task-independent decreases of amygdala-FC with fronto-parietal regions and reduced faces-associated amygdala-fusiform gyrus FC. Resilience corresponded to task-independent increases in amygdala FC with the perigenual anterior cingulate cortex (pgACC) and increased FC between amygdala, pgACC, and SFG during faces matching.

Conclusion. Our results encourage a refinement of the limbic-cortical imbalance model of depression. The validity of proposed risk and resilience markers needs to be tested in prospective studies. Further limitations are discussed.

Dr. Wei Zhang successfully defended her doctorate's thesis at **Radboud University** in Nijmegen in November! We cordially congratulate her on this achievement and invite everyone to read her thesis, entitled **"The stressed brain: Neural signatures of acute stress and their relevance for long-term stress vulnerability.**

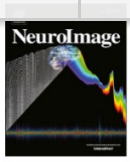
Her recent publication in *NeuroImage* from April 2019, entitled **"Acute stress alters the 'default' brain processing"**, is based on samples from the large-scale study on police officers in training, which is also part of the **DynaMORE** project.

NeuroImage 189 (2019) 870–877

Contents lists available at ScienceDirect

NeuroImage

journal homepage: www.elsevier.com/locate/neuroimage



Acute stress alters the 'default' brain processing

Wei Zhang [a,b,*], Mahur M. Hashemi [a,b], Reinoud Kaldewaij [a,b], Saskia B.J. Koch [a,b], Christian Beckmann [a,c,d], Floris Klumpers [a,b,1], Karin Roelofs [a,b,1]

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Highlights from the 5th Resilience Symposium

This year's **5th International Symposium on Resilience Research** took place in Mainz from 25-27 September 2019, and attracted prominent speakers from Australia, Europe, Israel, and the USA. The first session focussed on resilience to traumata, including police trainees and soldiers. The second session presented the most recent findings in animal models, while the third session discussed the concept of resilience in the 'chronic social defeat' animal model. The fourth and last session emphasised the practical implementation of gained resilience knowledge in everyday health care. In addition, the **DRZ**, **DynaMORE**, and **intresa** organised a well-attended **pre-symposium workshop** on methods in resilience research for all Early Career Scientists on Tuesday, 24 September 2019. Topics included ambulatory monitoring, network modelling, and longitudinal analyses.

13:15 **Karin Roelofs, Donders Institute, Radboud University, Nijmegen**
Neurocognitive markers of resilience to trauma: a longitudinal prospective study among police trainees
14:00 **Arieh Shalev, New York University**
Resilience is the Default, How not to Miss it
14:45 **Coffee break**
15:15 **Murray B. Stein, University of California, San Diego**
Genetic Perspectives on Risk and Resilience to Traumatic Stress
16:00 **Israel Liberzon, Texas A&M University**
Neural signatures of resilience using imaging modalities

YOUNG INVESTIGATOR SHORT TALKS

16:45 **Selected poster abstracts**

POSTER SESSION

17:30 **Poster session with Wine & Cheese**

SESSION 02:
MODELLING RESILIENCE TO STRESS IN ANIMALS: RECENT DEVELOPMENTS

09:00 **Gal Richter-Levin, Haifa University**
Studying neural mechanisms of stress resilience in an animal model of PTSD
09:45 **Philipp Faure, CNRS and Sorbonne, Paris**
Social behavior and Individual traits variability
10:30 **Coffee break**
11:00 **Jan-Marino Ramirez, University of Washington and Seattle Children's Research Institute**
Growing up in our overstimulating media world: insights gained from human and animal studies

YOUNG INVESTIGATOR SHORT TALKS

11:45 **Selected poster abstracts**

POSTER SESSION

12:30 **Poster session with lunch**

SESSION 03:
THE DEBATE: WHAT IS RESILIENCE IN THE CHRONIC SOCIAL DEFEAT MODEL?

14:30 **Sam Golden, University of Washington**
Historical overview and my take on the model
15:00 **Christine Denny, Columbia University**
My take
15:15 **Sarah Ayash & Marianne B Müller, DRZ Mainz**
Our take
15:30 **Raffael Kalisch, DRZ Mainz**
A human take
15:45 **Coffee break**
16:15 **Debate and question round**
Discussants: Sam Golden, Christine Denny, Marianne Müller, Raffael Kalisch

GUTENBERG SOCIAL

18:00 **Free drinks, food, music and a look at the world's first printed bible (ticket available on site, 5 € students and postdocs, 15 € PIs)**

SESSION 04:
MAKING RESILIENCE

09:30 **Richard Bryant, University of New South Wales, Sydney**
Promoting Resilience in Countries with no Health Systems
10:15 **Cynthia Stonnington, Mayo Clinic in Arizona**
"Finding your flock" to foster resilience among medical professionals
11:00 **Coffee break**
11:30 **Nicole Geschwind, Maastricht University**
From vulnerability to resilience against depression: the role of positive emotions

YOUNG INVESTIGATOR POSTER AWARD CEREMONY

12:15 **Poster award ceremony – conclusions and farewell**

12:30 **Lunch**

Most recent DynaMORE publications

Four new manuscripts that were directly funded by **DynaMORE** were published in 2019 Feel free to click on the titles below to access the original publications. Congrats to all authors!

- Kalisch R, Cramer, AOJ, Binder H, Fritz J, Leertouwer IJ, Lunansky G, Meyer B, Timmer J, Veer IM & van Harmelen A-L (2019). **Deconstructing and reconstructing resilience: a dynamic network approach.** *Perspectives on Psychological Science.* 14(5): 765–777.

- Kampa M, Schick A, Sebastian A, Wessa M, Tüscher O, Kalisch R, Yuen K (2019). **Replication of fMRI group activations in the neuroimaging battery for the Mainz Resilience Project (MARP).** *NeuroImage.* 204: 116223 [Epub ahead of print]

- Kasanova, Z., Hajduk M., Thewissen, V., Myin-Germeys, I. (2019). **Temporal associations between sleep quality and paranoia across the paranoia continuum: An experience sampling study.** *J Abnorm Psychol.* [Epub

- Wang, H., Verkes, R.J., Roozendaal, B., & Hermans, E.J (2019). **Toward Understanding Developmental Disruption of Default Mode Network Connectivity Due to Early Life Stress.** *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*. 4 (1):5-7.

CHRISTMAS: Bake a resilience cookie

This German Christmas cookie recipe is called **"Friend Of The House Cookie"** and will provide you with an extra boost of energy and resilience during cold or dark winter days. Light a few candles, turn on your favorite music, and start baking:

Ingredients

1 egg
2 cups all-purpose flour
¼ cups granulated sugar
1½ sticks chilled unsalted butter, cubed
¼ teaspoon salt
½ teaspoon vanilla extract
7 oz almond paste or marzipan
5 oz dark chocolate
½ cup apricot jam
½ cup cashew nuts
4 tablespoons granulated sugar

Instructions

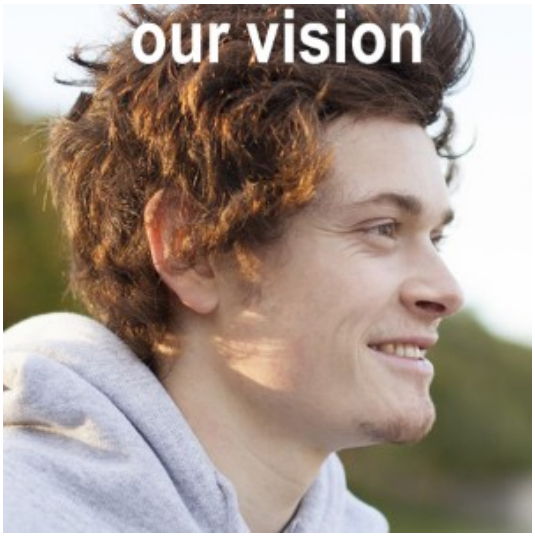
- In a bowl of standing mixer, combine flour, sugar and salt. Pulse a few times. Add butter, egg and vanilla extract and process until soft dough starts to form and pulls away from the sides of the bowl.
- Place the dough onto a plastic, pat it into a disc, cover with another piece of plastic and chill for 1 hour.
- Preheat the oven to 350 F and cover 2 baking sheets with a parchment paper.
- On a lightly floured surface, roll out the dough ¼ inch thick. Using a 2-inch round cookie cutter, cut out cookies. Carefully transfer them onto prepared baking sheets. Gather the scrap dough, roll it out, and cut again. There should be 48 rounds.
- Bake cookies for 20 minutes. Rotate the baking sheets from top to bottom and front to back halfway through baking. Remove from the oven and transfer to cooling rack.
- Put apricot jam in a microwave-safe dish and heat for about 30 seconds until jam is runny.
- Brush a thin layer of jam on half of the cookies and cover with the remaining cookies.
- Place almond paste between two sheets of parchment paper and roll it out ⅛ inch thick. Using the same 2-inch round cookie cutter, cut out rounds. You need 24 rounds.
- Brush the top of each cookie with a thin layer of apricot jam and top with almond paste round.

- Place dark chocolate in a small bowl or cup and put it in the microwave. Heat it in 30 seconds intervals stirring in between sessions until chocolate has melted. Dip the top of each cookie in the melted chocolate and carefully place it on a wire rack.
- Heat a medium non-stick skillet over medium heat and add cashews. Toast them tossing occasionally until lightly browned, about 5 minutes. Add sugar and stir until the nuts are evenly coated in the melted sugar. Transfer caramelised nuts onto a parchment paper and let them cool for a few minutes.
- Roughly chop cashew and place about 1 teaspoon of chopped nuts in the center of each cookie.

Happy Holidays & Enjoy!

For updates on resilience research in general, follow **@ResilienceRes** on Twitter!

Website Contact us Follow us



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