Society for Ambulatory Assessment

3rd conference

June, 20-22 2013, Amsterdam, The Netherlands

Book of Abstracts

Published by the SAA Executive Committee, Amsterdam, The Netherlands, 2013

This conference was sponsored by:

Occasion specificity and situational conditions of momentary clarity of feelings: Two daily life studies

Arndt, C.[1]; Lischetzke, T.[1]; Crayen, C.[2]; Eid, M.[2]

[1] *Department of Psychology, University of Koblenz-Landau, Landau, Germany*
[2] *Department of Education and Psychology, Free University of Berlin, Berlin, Germany*

Momentary clarity of feelings refers to the extent to which individuals know what they feel at a given moment. In previous ambulatory assessment research, momentary clarity of feelings has been demonstrated to facilitate mood regulation. Most research to date, however, has focused on individual differences in dispositional clarity of feelings. Hence, the degree to which momentary clarity of feelings varies intraindividually in daily life and the situational conditions of being momentarily clear vs. unclear about one's feelings are largely unknown. Therefore, the present research aimed at analyzing the occasion specificity and the situational conditions of momentary clarity of feelings. As situational predictors of momentary clarity of feelings, we focused on the complexity of emotional experience and on appraisals of the emotion-generating event (familiarity, controllability, and personal relevance). We hypothesized that a more complex (i.e., more mixed) emotional state is related to lower momentary clarity. For negative events, we expected higher familiarity, controllability and personal relevance to be positively related to momentary clarity. Momentary clarity was measured indirectly by means of latencies of responses (RT) to state affect items. Previous studies have shown that this indirect measure is a valid indicator of momentary clarity. We conducted two ambulatory assessment studies (N = 51 students, with 3 occasions per day for 7 days, and N = 164 students, with 7 occasions per day for 14 days). Structural equation modeling was used to analyze consistency vs. occasion specificity. A latent state-trait model revealed that 66 % of the variability in indirectly measured clarity (i.e., RT) was measurement-occasion specific. Situational predictors of momentary clarity were analyzed on the within-persons level using multilevel modeling. The findings from both studies consistently showed that a more complex emotional experience was related to lower momentary clarity of feelings (i.e., shorter RT to emotion items). This effect held for both negative and positive events. The relationship between momentary clarity and the event appraisals familiarity, controllability, and relevance were analyzed separately for positive and negative events. Multilevel regressions showed that higher personal relevance of a positive event was related to higher clarity of feelings (i.e., shorter RT to mood items). Familiarity and controllability of a positive event were not associated with momentary clarity. Negative event appraisals were unrelated to momentary clarity. These results were consistent across the two studies. The results are discussed with respect to the role of clarity of feelings in the affect regulation process.

Examining effects of daily work interruptions using an electronic tally

Baethge, A.B.; Rigotti, T.

Department of Psychology, Work-, Organizational-, and Businesspsychology, Mainz, Germany

Work interruptions are daily stressors that could be shown to be negatively related to workers' well-being and performance. Up to date, work flow interruptions in field studies have solely been operationalized using ratings on the frequency of these events. However, laboratory and simulation studies could show, that a number of other features are important to consider. Among those are the complexity of the primary, and the interruption task, the

timing, as well as the time needed to deal with the interruption. Two studies will be presented, were we employed an electronic (study A) and a paper-and-pencil (study B) tally to examine the effects of different characteristics of work flow interruptions on well-being applying a diary study design. The samples consisted of N = 46 (A), and N = 22 (B) German office workers. In both studies, participants filled in a daily diary over five consecutive working days. During the working day, participants continuously recorded any work flow interruptions, and provided ratings on the complexity of the primary and the interruption tasks, following an event sampling strategy. Furthermore the length of the interruption was automatically recorded in study A (using the electronic tally). In the evening participants provided self-ratings on strain, workload, and time pressure. The data was analyzed using multi-level analyses to test for within subject effects over time. We found that the various characteristics of interruptions had different effects on the wellbeing of the employees. To name an example, the complexity of interruptions had an effect on the perceived workload while the duration had an effect on the perceived time pressure. Based on these findings, and experience with the employed methods, we aim to name difficulties that arose using the tallies in the field and discuss possible solutions. Furthermore, we would like to discuss how the tally method could be combined with the continuous measurement of physiological data (e.g. heart rate).

Therapygenetics in mindfulness-based cognitive therapy: do genes impact on therapy-induced change in real-life reward experience?

Bakker, J.M. ; Lieverse, R. ; Menne-Lothmann, C. ; Geschwind, N. ; Peeters, F. ; Wichers, M.

Department of Psychiatry & Psychology, Maastricht University, Maastricht, The Netherlands

Background Positive Affect (PA) has been shown to play an important role in resilience against depression. Mindfulness meditation, and Mindfulness-Based Cognitive Therapy (MBCT), have been proposed, and subsequently shown, to be a method that can increase PA. It is suggested that, since hedonic capacity has a heritability of 50%, heterogeneity in treatment outcome may be traced back to the biological systems regulating positive emotional experience (i.e., dopaminergic and opioid transmission). The current study is the first to examine the contribution of genetic variation to individual differences in PA in response to MBCT. Methods A selection of genetic variations under study was made based on (i) their involvement in dopamine and/or opioid regulation (ii) previous literature showing associations between the selected variations and psychopathological disorders associated with a deficient reward system, such as depression or addiction. 124 people with residual depressive symptoms were randomized to either an MBCT group or treatment as usual (control) group. Experience Sampling Methodology (ESM) was used to measure positive emotions in an ecologically valid and reliable manner before and after the intervention. Genomic DNA was obtained from saliva samples. Multilevel linear regression analyses were performed to examine the interaction between SNP, group (MBCT vs. control) and time (baseline vs. post measurement). Results Of the 38 Single Nucleotide Polymorphisms (SNPs) originally included a final set of 18 SNPs was suitable for analysis, of which 2 were in perfect linkage disequilibrium equilibrium (r2=1). When correcting for multiple testing with Holm's method, 10 of the 18 SNP x time (baseline-post) x group (MBCT-control) analyses were significant. The heterozygotic variant of the SNPs in the OPRM1 gene (rs495491, rs609148/rs648893, rs3823010) was consistently associated with a larger boost in PA from baseline to post assessment in the MBCT group. For three other SNPs (rs1824024 and rs2061174 in CHRM2, rs6276 in DRD2) the largest increase in PA from baseline to post assessment appeared to be in people in the

MBCT group with the homozygotic variant of these SNPs. These effects were furthermore reflected in a larger decrease in HAM-D scores in the MBCT group compared to the control group, in participants with the heterozygotic (OPRM1) or homozygotic (CHRM2 and DRD2) variants of these SNPs. In the remaing SNPs the heterozygotic (for rs4633/rs4680 in COMT, rs936461 in DRD4, rs1799836 in MAO-B) or homozygotic (for rs6347 in SCL6A3) control group was associated with a significant decrease in PA from baseline to post assessment. Conclusion Considerable variation is evident in response to psychological therapies for depression. The current study shows that variation in response to MBCT partly depends on genetic factors that are assumed to be involved in the regulation of positive affect. These findings could contribute to our understanding of the underlying pathophysiological process of depression and to future prediction of treatment response (stratified medicine).

Using ESM to examine the mechanism of change of mindfulness based cognitive therapy

Batink, T.[1] ; Peeters, F.[1] ; Geschwind, N.[1] ; Van Os, J.[2] ; Wichers, M. [1]

[1] *Department of Psychiatry & Psychology, Maastricht University, Maastricht, The Netherlands*
[2] *Department of Psychiatry and Psychology, Maastricht University Medical Centre, Maastricht, The Netherlands. Department of Psychosis Studies, King's College London, London, England*

Introduction Major depressive disorder is an invalidating condition, with high rates of residual symptoms and high probability of recurrence. Mindfulness Based Cognitive Therapy (MBCT) is a psychotherapeutic intervention to prevent recurrence of depressive episodes. At present, it is not well understood how MBCT leads to reduction and prevention of symptoms of depression. Understanding the mechanisms underlying change arguably is the first step in further optimizing this treatment. Previous studies on the mechanism of change of MBCT focused on the mediating role of mindfulness skills and cognitive processes (Kuyken 2010, Shahar 2010, van Aalderen 2012). This study aims to replicate preceding studies on the mechanisms of change of MBCT, and also extends the scope by adding momentarily assessed measures of affect as possible mediators (measured prospectively with experience sampling). We also examined to what degree different mechanisms of change may underlie the impact of MBCT on symptom reduction in participants with multiple major depressive episodes (=3 MDE) compared to those with fewer major depressive episodes (= 2 MDE). Method Adults with current residual depressive symptoms after at least one episode of major depressive disorder (mean age 43.9 years, SD 9.6; 75 % female; all Caucasian) were randomized to MBCT (n=64) or treatment as usual (TAU; n=66) in a parallel, open-label, randomized controlled trial. Mindfulness skills (KIMS) and cognitive processes as worrying and rumination (PSWQ, RSS) were assessed. Positive affect (PA) and negative affect (NA) were assessed using the experience sampling method . An exploratory, but systematic approach was chosen using Sobel-Goodman mediation analyses to identify mediators on the pathway from MBCT to reduction in depressive symptoms. Results The effect of the MBCT intervention on depressive symptoms in the total group was significantly mediated by changes in mindfulness skills (Proportional effect = 46.8, $p = 0.01$) The effect of the skills on depressive symptoms, in turn, was mediated by changes in worrying (Prop. effect = 44.5, $p < 0.001$) and changes in positive affect (Prop. effect = 48.3, $p < 0.001$), but not negative affect. Finally, the effect of worrying on depressive symptoms, was mediated by changes in positive affect (Prop. effect = 43.5, $p < 0.001$) and negative affect (Prop. effect = 37.5, $p < 0.001$). Rumination was not a significant mediator in this model. Change in positive affect was the largest mediator (61 %) of the effect of MBCT on depressive symptoms. The effect of MBCT on depressive

symptoms in the subgroup with = 2 MDE was mediated by changes in the mindfulness skills (Prop. effect = 76.7, p = 0.01). The effect of the skills on depressive symptoms, in turn, was mediated by changes in worrying (Prop. effect = 48.7, p < 0.001). Finally, the effect of worrying on depressive symptoms was mediated by changes in positive affect (Prop. effect = 31.3, p = 0.03) and negative affect (Prop. effect = 33.4, p = 0.01. Change in worrying was the largest mediator (85 %) of the effect of MBCT on depressive symptoms. The effect of MBCT on depressive symptoms in the group with = 3 MDE was mediated only by changes in positive affect (Prop. effect = 80.1, p = 0.01) and negative affect (Prop. effect = 51.5, p = 0.04) (Table 3). In contrast with the subgroup with = 2 MDE, mindfulness skills and the worrying did not contribute to the effect of MCBT on depressive symptoms in this model. Eighty percent of the effect of MBCT on depression was mediated by changes in positive affect. Conclusion This study replicated earlier findings that therapeutic effects of MBCT are mediated by changes in mindfulness skills and worry. Second, results showed that changes in momentary positive and negative affect significantly mediated the effect of MBCT on depressive symptoms, as well as the effect of worry on depressive symptoms. Third, within the group of patients with a prior history of = 2 episodes, predominantly changes in cognitive and to a lesser extent affective processes mediated the effect of MBCT. However, within the group of patients with a prior history of = 3 episodes, only changes in affect were significant mediators for the effect of MBCT. This study provides new insights in the cognitive and affective factors that mediate the reduction of depressive symptoms associated with MBCT.

Ambulatory mobility and physical activity monitoring of elderly; a pilot study

Boerema, S.T.; Vollenbroek-Hutten, M.M.R. ; Hermens, H.J.

Roessingh Research and Development, Telemedicine group, Enschede, the Netherlands. University of Twente, Faculty of Electrical Engineering, Mathematics and Computer Science, Telemedicine group, Enschede, The Netherlands.

INTRODUCTION As we age, our ability to be mobile – the ability to move physically – deteriorates slowly. Slow physical and cognitive decline results in reduced mobility over time and an increasing need for assistive devices. Mobility is a good indicator of health status and independent living. Mobility improves endurance and muscle strength, and can improve psychological well-being and quality of life by increasing the person's ability to perform a greater range of activities of daily living (ADL). The extent to which mobility aids fulfil all mobility needs of independently, solitary living elderly is unclear. We investigated a method to objectively monitor mobility and physical activity of elderly using ambulatory wireless technology during daily living, and studied the monitored physical activity compared to a sedentary population of healthy office workers. METHODS Four elderly women (age 77 ± 10), living independently, solitary and in need of some assistance to perform their activities of daily living (e.g. doing groceries) were asked to wear a wireless activity sensor (3D accelerometer, Promove3D from Inertia Technology, Enschede) for three days, during waking hours. The activity sensor provides counts per minute, similar to Bouten et al. (1997) [1]. The sensor was wirelessly connected to a smartphone. For measuring outdoor mobility, location was tracked using the GPS sensor of the smartphone. All measurement data is forwarded to a secure online database for remote monitoring. Physical activity is reported in an average cumulative scores per day [2], and in terms of activity and inactivity periods, based on an activity intensity threshold (150 counts). Also, the participants were asked to fill in the SF-36 and a dairy was filled in on the PDA, reporting their transportation means. The physical activity dataset is compared with physical activity of a sedentary population of healthy office worker monitored with

the same devices. RESULTS The participants scored low on the physical functioning SF-36 subscale, 34 ± 16 points, compared to a norm score of 61 ± 26 of a Dutch population of men and women age 65-85 [3]. The participants reported functional limitations like having difficulty to walk several hundreds of meters and when climbing more than one staircase. Due to bad weather the elderly stayed indoors, more than normal, and GPS was not included in the analysis. Participants wore the activity monitoring system for 1 – 3 days, resulting in a total of 9 monitoring days, with an average duration of 12:15h; start time 08:22h ± 1:52, and end time 20:37h ± 1:46h. The average accumulated physical activity of the elderly was 3470 counts per day, which is 79% of the average cumulative score of healthy office workers (n=20) during their waking hours. Most activity takes place during short periods of activity; elderly accumulate 48.7% of their activity in bouts up to 5 minutes, office workers 60.3%. The activity intensity per activity bout is lower (8.2 ± 13 minutes Elderly; 7.3 ± 13 minutes Office workers) and shorter (394 ± 228 average counts per activity period Elderly; 465 ± 303 average counts per activity period Office workers) in elderly and shows lower standard deviations than in office workers. DISCUSSION AND CONCLUSION The pilot study with four elderly showed that physical activity of elderly can be captured by a wearable activity sensor. Though, how the reported measures of physical activity, like a cumulative score, duration and intensity of activity periods relate to mobility is not fully clear. The elderly participants were limited in their mobility and physical activity, and although there are differences with the healthy office workers, it is not so easy to link specific features to mobility and mobility needs for performance of activities of daily living. Office workers are more active than the elderly, but achieve this level in more activity bouts of a very short duration. Possibly, interventions on performing short activity bouts can also help elderly to increase their physical activity and improve their mobility. Telemonitoring can be applied to assess the health status of elderly persons, though further investigation of ambulant monitoring of activity patterns of elderly with activity sensors, GPS and possibly other measures is needed. A next step will be towards monitoring gradual deterioration in the health status of elderly persons. This research was funded within the Creative Industry Scientific Programme (CRISP). CRISP is supported by the Dutch Ministry of Education, Culture and Science.

Mapping the temporal course of intake-predicting variables using a self-monitoring tool for smartphones: A pilot study

Boh, B.[1] ; Roefs. A.[1] ; Claes, D.[2] ; Fossel, J.[2] ; Jansen, A.[1]

[1] *Department of Psychology and Neuroscience, Maastricht University, Maastricht, The Netherlands*
[2] *Department of Knowledge Engineering, Maastricht University, Maastricht, The Netherlands*

Specific overeating, defined here as the consumption of high caloric snacks or unhealthy lunch or dinner options, contributing to a state of greater energy intake than expenditure over a given period of time, is the result of complex interaction between physiological signals, contextual cues, dysfunctional cognitions and maladaptive behaviour in non-disordered obese individuals. Explicit clinical assessment of these variables is necessary for providing properly tailored weight management therapy, and is commonly performed using scales/questionnaires or via interviewing. There are several disadvantages associated with such measures. Retrospective assessment relies on accuracy of self-report, which is subservient to memory and potential bias. Furthermore, questionnaires are based on top-down (expert) clustered characteristics and thus emphasize behaviour that is in line with what is assessed. Clinical interviewing, on the other hand, can be cost-intensive and laborious, and also relies on retrospection. We

hypothesize that (specific) overeating events do not merely arise as the consequence of a set of stable, global, generalizable principles, but are more intricately related to the co-occurrence of associated variables, which vary over time in their share of cause within and between individuals. In the current pilot study, we will attempt to establish individual temporal profiles of eating events, contexts, craving, emotions and cognitions based on data from a smartphone self-monitoring application. Participants will receive a short preliminary training, and will proceed to self-monitor daily for a 2-week period using the application. Data entry is both participant-initiated based on strong, conscious craving (a strongly experienced urge to eat) and actual eating events, and is additionally performed via pseudorandomized experience sampling of mood, context and craving, by requesting input approximately every 2 hours, with two intensive (every 20 minutes for 2 hours) baseline (non-eating) periods and two intensive post-consumption periods. We will administer several food intake-related questionnaires (including the PEBQ, DEBQ, DBTS and EAH scales) with a comparable scope to our self-monitoring inquiries and will compare relevant outcome measures. Additionally, participants' body-mass index is measured pre- and post-test to indicate the influence of a short period of self-monitoring using the application on weight loss. Lastly, we will cluster inter-profile recurring patterns according to themes that predict overeating, so that they can be linked to appropriate cognitive behavioural weight management techniques. Preliminary data will be presented at the conference.

Reactivity to stressful events: Differentiating individuals according to their mode of reactivity

Brose, A.[1]; Schmiedek. F. [2]

[1] *Center for Lifespan Psychology, Max Planck Institute for Human Development, Berlin, Germany*
[2]*German Institute for International Educational Research, Max Planck Institute for Human Development, Berlin, Germany*

People react to stressful events as they go about their daily lives. When confronted with a stressor they experience changes in emotions, physical symptoms, subjective distress, and rumination. These modes of reactivity are often investigated separately and the particular reactivity mode may be determined by individual differences (e.g., some individuals are particularly sensitive to bodily sensations whereas others' attention is particularly caught by negative evaluations of the stressor). At the same time, similar variables moderate reactivity in different domains. For example, individuals high in neuroticism react more strongly to stressors in terms of affective reactivity, but also in terms of physiological reactivity. A general reactivity factor may thus exist that determines individuals' reactivity across domains of functioning. The existence of such a factor would mean that some individuals react to stressors relatively strongly across reactivity modes (e.g., affective, cognitive, physiological) whereas others react less strongly across these modes. The aim of this study was to bring these two perspectives together. We first tested the existence of a general reactivity factor. Secondly, we explored the possibility to differentiate between individuals according to their way of reacting to events. 204 individuals provided data on daily experiences on about 100 daily occasions (e.g. daily affect, distress, physical symptoms, rumination). Factor analyses indeed revealed the existence of a general reactivity factor—individuals with strong affective reactivity were also likely to react strongly on physical symptoms, perceived stress, and rumination. The next data analytical step is to explore whether individuals can still be distinguished according to their mode of reactivity by means of a new technique called Structural Equation Model Trees (Brandmaier, Oertzen, McArdle, & Lindenberger, 2012). This technique is an exploratory technique that

provides means for finding covariates that predict differences in structural parameters such as factor loadings. Thus, this technique is suitable for differentiating among people that are more or less reactive in a specific domain given a common reactivity factor. Distinguishing between individuals according to their mode of reacting to stressful events is highly important for interventions because it may help guiding decisions on how to treat individuals that are not being able to cope with stress.

From GIGO to MIMO: Using visualisation and natural language generation for feedback on ambulatory assessment

Burton, C.[1] ; Wolters, M.[2] ; Matheson.C.[3] ; Janarthanam, S [4]

[1] *Centre of Academic Primary Care, University of Aberdeen, United Kingdom*
[2] *School of Informatics, University of Edinburgh, United Kingdom*
[3] *School of Informatics, University of Edinburgh, United Kingdom*
[4] *Mathematical & Computer Sciences, Heriot-Watt University, United Kingdom*
Help4Mood Consortium (http://help4mood.info)

Background Ambulatory assessment technologies concern themselves with data collection, and in most cases this requires a degree of active participation from the user, either by entering data directly or by adapting their routines to permit automatic data collection. Whenever data is collected, particularly when this is in a clinical or service setting, there is an ethical and empirical argument that data collection by the user should be reciprocated by feedback and use of the data, for instance in treatment planning or aiding interpretation. Help4Mood (http://help4mood.info) is a European Union FP7 funded programme to develop an integrated system to support the management of depression. It includes data collection (mood, thoughts, activity, sleep); interaction via an onscreen avatar and feedback of reports for use by both the patient and the clinician. Approach In devising the report format we have examined the way such information can be summarised and presented based on focus groups with professionals and patients. In implementing it we have examined and used both graphical methods and computer based natural language generation. Findings The focus groups indicated that in order to fit with routine practice, reports must be brief and provided as an A4 sized pdf file which can be emailed, viewed onscreen or printed. While there are principles of graphic design for reporting data, relatively little is known about visual charts in clinical practice. Patients identified that reports should be able to demonstrate bad days while still allowing them to "maintain face" during the consultation. When individual data points (rather than summaries) are provided, they should be clearly identifiable by day of collection in order to permit reflection and contextualisation. Implementation of the reports is being developed using both graphical and text approaches. The presentation will give examples of the way that data are used to generate reports which aim to add value to the data which the user has entered by meaningful visualisation and summarisation. Conclusion Recent developments in methods and technologies mean that the inputs to ambulatory assessment have dramatically increased in quantity and quality but to date have not been matched by outputs. We will suggest that Help4Mood represents another step on the road from GIGO "garbage in, garbage out" to MIMO "Measurement in, meaning out".

Feasibility, utility, psychometric properties, reactivity, and capacity to elucidate mechanisms of change of proximal intensive assessment

Carlson, E.[1] ; Field, N.[2] ; Ruzek, J.[1] ; Bryant, R.[3] ; Dalenberg, C.[4]

[1] *National Center for Posttraumatic Stress Disorder, Palo Alto, USA, VA Palo Alto Health Care System U.S. Department of Veterans Affairs, USA*
[2] *Palo Alto University, Paolo Alto, USA*
[3] *University of New South Wales, Australia*
[4] *Alliant International University, Trauma Research Institute, San Diego, USA*

Introduction: When the phenomena or experiences of interest are discrete or changing rapidly, such as suicidal impulses, episodes of panic, intrusive distressing memories, negative thoughts, or social interactions, ambulatory assessment (AA) sampling methods such as ESM and EMA may not be optimal. Samples that reflect points in time or very brief periods of time may not accurately represent the entire time period of interest. ESM and ESA methods can impose a high burden on participants who must respond to very frequent prompts, and their use may not be feasible in some clinical populations. Participants may also respond differently to prompts across different states or activities. When frequent samples of experience are assessed, those who are under duress or have their normal routines disrupted may miss many prompts and underreport their distressed states, because they respond to fewer prompts when upset. Furthermore, calculating an average across samples of states that are changing cannot provide information about the dynamics of change. An alternative to methods that sample behavior are methods that collect complete reports on the entirety of experience at fixed intervals, such as daily diary methods which assess at fixed interval of one day. Fixed interval methods are not new, but there is very little research on their psychometric properties. Because we were interested in studying phenomena that might be fleeting or dynamic in individuals who were under duress, we studied the validity of an intensive, fixed interval AA method that we call Proximal Intensive Assessment (PIA). PIA has several clinically-relevant measurement advantages: • It allows assessment of phenomena in time frames that match their occurrence. • It is not subject to as much error from memory decay as reports summarizing days or weeks. • It can be used to address specific clinical research questions even when relatively few participants are available. • It can reduce the cost of clinical studies, because fewer participants are needed to achieve the statistical power to detect effects. • It allows collection of data that can elucidate mechanisms of change in studies of individuals or groups by allowing examination of relationships among experiences, phenomena, and behavior – including their strength and directionality. This introduces the possibility of investigating individual differences in mechanisms of change for affect, cognition, or behavior in persons who have the same psychological disorder, who are exposed to the same conditions or experiences, or who are receiving the same treatment. This presentation will describe research on the feasibility, utility, psychometric properties, reactivity, and capacity to elucidate mechanisms of change of PIA. Method: In a sample of adults who were recently exposed to severe, traumatic injury of themselves or a family member (N = 120), we collected data on variability in PIA reports, reliability and validity of PIA reports, and reactivity to the PIA method. One hundred participants were randomly assigned to PIA or no PIA groups and were assessed at baseline, after seven days, and at two months post-event with standard measures of PTSD, dissociation, negative cognitions, emotional approach coping, and reactions to research participation. The same constructs were assessed on handheld devices every 4 hours for 7 days in the subset of participants who were assigned to PIA. Results: Sufficient data was collected for analysis from 85% of those who began PIA. Data analyses showed that PIA demonstrated a capacity to detect significant between and within-subject

variability. There was strong evidence of internal consistency and convergent, divergent, and construct validity of PIA measures. There was no effect of PIA on symptoms or distress during participation. Examination of relationships between real time emotions and aspects of social interactions thought to contribute to recovery showed meaningful individual differences in processes. Conclusions: PIA shows promise for studying mechanisms that contribute to the development, maintenance, and treatment of psychological disorder and can be used clinically to monitor patterns of behavior and symptoms.

Bridging brain and real-life behaviour: Mapping momentary transfer of psychosis in daily life to alterations in dopamine reactivity

---

Collip, D.

Department of Psychiatry & Psychology, Maastricht University, Maastricht, The Netherlands

Context. Despite a multiplicity of imaging studies, there is still no basic understanding of the pathophysiology of psychotic disorders. Development of psychotic experiences occurs in the context of individuals' daily life, the neural processes, however, that could mediate/moderate daily life interactions and momentary symptom formation have not been investigated. Objective. To examine brain-experience interplay, focusing on the association between prefrontal dopamine reactivity on the one hand, and, on the other, the tendency of mental states of psychosis to persist from one moment to the other in the flow of daily life, thus taking into account the smallest building blocks of psychotic psychopathology Design. A translational research approach combining a Positron Emission Tomography study (during a prefrontal cortex challenge) and a momentary assessment study using a within-subject design. Participants. The final sample consisted of 26 individuals, 14 healthy first-degree relatives of individuals with a psychotic disorder and 12 healthy control participants with no family history of psychotic illness. Main Outcome Measure(s). Daily-life ratings of momentary psychotic experiences, in particular the tendency of those to persist from one moment to the next and the moderating effects of prefrontal dopamine activity and familial liability for psychosis. Results. The momentary assessment study yielded a total of 977 observations, clustered within 24 individuals. Increased persistence of psychotic experiences in daily life was associated with decreased prefrontal dopamine activity. These findings seemed to be driven by the group of individuals with increased liability for psychotic disorder (though 3-way interactions were non-significant after correction for multiple testing). Conclusions. Our results, for the first time, bring together prefrontal cortex dopamine activity as a distinct neural mechanism and daily life expression of psychotic symptomatology, indicating that investigation of symptomatic variability in the context of daily life in combination with imaging techniques is a promising strategy in social neuroscience.

Putting a hold on the downward spiral of paranoia in the social world: A randomized controlled trial of Mindfulness-Based Cognitive Therapy

Collip, D.

Department of Psychiatry & Psychology, Maastricht University, Maastricht, The Netherlands

Context. Paranoia embodies altered representation of the social environment, fuelling altered feelings of social acceptance leading to further mistrust. Mindfulness-based cognitive therapy (MBCT) may relieve paranoia and reduce its impact on social acceptance. Objective. To determine whether MBCT alters momentary feeling of paranoia and social acceptance in daily life. Design. Randomized controlled trial of daily-life repeated measures (up to 120 per participant) before and after allocation to MBCT or waiting list control. Participants. Volunteer sample of 130 eligible men and women with residual affective dysregulation after at least one episode of major depressive disorder. Interventions. Eight weeks of MBCT in groups of 10-15 participants in addition to participants' usual treatment (if any). Trial registration: MindMaastricht, NTR1084, Netherlands Trial Register, http://www.trialregister.nl/trialreg/admin/rctview.asp? TC=1084. Outcome Measures. Daily-life ratings of paranoia and social acceptance. This manuscript concerns additional analyses of the original trial; hypotheses were developed after data collection (focus initially on depressive symptoms) but before data analysis. Results. Sixty-six participants were assigned to the waiting list control group and 64 to the MBCT intervention group, of whom 66 and 61 respectively were included in the per-protocol analyses. Intention-to-treat analyses revealed a significant group by time interaction in the model of momentary paranoia ($b=-.18$, $p<0.001$, $d=-0.35$) and social acceptance ($b=.26$, $p<0.001$, $d=0.41$). Paranoia levels in the intervention group were significantly reduced ($b=-.11$, $p<0.001$) and feelings of social acceptance significantly increased ($b=.18$, $p<0.001$), whereas in the Control condition a significant increase in paranoia ($b=.07$, $p=0.008$) and a decrease in social acceptance was apparent ($b=-.09$, $p=0.013$). The effect of paranoia fuelling decreases in social acceptance was significantly reduced in the MBCT, but not the control group (group by time interaction: $b=.12$, $p=0.022$). Results were similar for the per-protocol analyses. Conclusions. MBCT confers a substantial benefit on subclinical paranoia and may interrupt the social processes that maintain and foster paranoia in individuals with residual affective dysregulation.

The genetics of emotional experience: The Daily Life Study

Conner, T.S.

Department of Psychology, University of Otago, New Zealand

Ambulatory assessment techniques are potentially powerful tools at the interface of genetics and psychology. By capturing experiences in real-time, over time, and within evocative contexts, ambulatory assessment provides a more sensitive measure of phenotypes that relate more strongly to genetic variation between people. In this talk, I will discuss a research study in progress – The Daily Life Study – which aims to use ambulatory assessment on a large-scale to understand the genetic and other biologic underpinnings of emotion. A total of 1400 young adult university students ages 18 – 25 will be recruited. To date, 907 young adults have completed the study. The study consists of an initial online questionnaire with measures of demographics, personality, and trait emotionality followed by 13 days of

intensive emotion tracking using text-messaging and a nightly Internet diary. On day 14, participants give a blood sample for DNA and other biomarker analysis. They also complete a follow-up questionnaire with retrospective measures of emotion. Genetic data have been analysed for over 600 of completed samples. Several preliminary results will be shared including evidence that daily positive affect is modulated by variation in the catechol-O-methyl transferase val/met polymorphism, and that this genotype-phenotype association is stronger when positive affect is measured in real-time rather than using traditional forms of assessment. This project aims to add new understanding of the genetics of emotion by measuring emotion in a psychologically sensitive way – to capture people in their lived moments.

High-risk adolescents with callous-unemotional traits: perception of anger and distress in staff of residential facilities in daily life

De Ridder, J.

Child and Adolescent Psychiatric Unit, University of Lausanne Medical School, Lausanne, Switzerland

High-risk adolescents with callous-unemotional traits: perception of anger and distress in staff of residential facilities in daily life Jill De Ridder1, Sandrine Pihet1, Maya Suter1, Roberto Caldara2 1Child and Adolescent Psychiatric Unit, University of Lausanne Medical School, Bugnon 25A, 1011 Lausanne, Switzerland 2Departement of Psychology, University of Fribourg, Rue de Faucigny 2, 1700 Fribourg, Switzerland Background Callous-unemotional traits in adolescents are associated with deficits in emotion processing, namely with impaired distress recognition, whereas performance for other emotions such as anger is preserved. However, this body of evidence has been built from computerized task results, which may have little in common with day-to-day experiences. Adolescents' perception of staff members' emotions was assessed using an Ecological Momentary Assessment procedure. We contrasted the recognition of distress with that of anger, taken as a control condition, and expected high-CU adolescents to present an impaired performance in the recognition of distress, with normal performance for anger. Methods Adolescents from a residential facility (N=63, 76% boys, mean age 14.5) reported 4 times a day on a PDA the intensity of distress and anger perceived in staff members, during 8 days, along with their own emotions, misbehaviours, and interpersonal conflicts. Staff reported their own anger and distress intensity experienced towards each adolescent during the EMA period. CU traits were assessed with the Youth Psychopathic traits Inventory, affective (YPI-Aff) and interpersonal (YPI-Int) scales. The data was analysed using Hierarchical Linear Modelling HLM, namely a 2-level model with perceived staff anger or distress as dependent variables. Results Multilevel regression analyses confirmed that all adolescents were quite accurate in identifying anger (B01=2.44, p=.001), particularly those with high CU traits (interaction term: B03=2.54, p=.013). In addition, all adolescents showed low accuracy in identifying distress (B01=1.69, p=.138). Surprisingly however, high-CU adolescents showed a similar accuracy pattern for distress (B03=-1.28, p=.454). They not only perceived staff members as considerably more angry (YPI-Aff: B01=11.33, p=.003; YPI-Int: B01=10.00, p=.003) and distressed (YPI-Aff: B01=10.24, p=.005; YPI-Int: B01=9.44, p=.002) after controlling for staff-reported emotions, but they reported also more distress-related feelings to the perception of distress in staff members (YPI-Aff: B21=0.30, p<.001; YPI-Int: B21=0.18, p=.003). In other terms, for high-CU adolescents, perceiving distress in staff members was associated with experiencing negative affect, in particular guilt (YPI-Aff: B21=0.17, p=.015; YPI-Int: B21=0.11, p=.051), shame (YPI-Aff: B21=0.15, p=.010; YPI-Int: B21=0.08, p=.096), and sadness (YPI-

Aff: B21=0.14, p=.012; YPI-Int: B21=0.08, p=.087). Conclusions High-CU adolescents showed no particular impairment in recognizing distress-related emotions in ecological daily life situations. They perceived higher intensity of both anger and distress. This pattern of results was paired by the experience of more distress-related feelings. High-CU adolescents might have compensated a possible impairment by efficiently using other available cues arising from real life interactions, and by relying on functional cognitive empathy skills. Our data challenges the view that antisocial behaviour in high-CU adolescents is rooted in an inability to perceive distress, which has profound implications for high-CU adolescents' rehabilitation.

A therapeutic application of experience sampling in the treatment of depression – Part 2: Impact of momentary assessment based feedback on daily life affective patterns

De Wild-Hartmann, J.[1] ; Menne-Lothmann, C.[1] ; Van Os, J.[2] ; Wichers, M.[1] ; Simons, C.[1]

[1] *Department of Psychiatry and Psychology, Maastricht University, Maastricht, The Netherlands*
[2] *Department of Psychiatry and Psychology, School of Mental Health and Neuroscience, Maastricht University Medical Centre, NL, King's College, King's Health Partners, Department of Psychosis Studies Institute of Psychiatry, London, United Kingdom*

A recently conducted randomized control trial (RCT) provided evidence that a six-week feedback intervention based on momentary ambulatory technology (MAT) can be effective in reducing depressive symptoms. The present study examined to what extent the feedback intervention impacted on daily life affective patterns. Given that the feedback intervention in the RCT was focussed on increasing positive affect in daily life situations, it was hypothesised that the MAT-based feedback was associated with changes in affect in daily life during the six-week intervention period, specifically with positive affect. The present study reports on the daily life results of this RCT in which 102 depressed patients were randomized to one of three arms. The MAT-based intervention consisted of MAT-monitoring combined with MAT-based feedback that was given during six weekly feedback sessions in addition to treatment as usual (TAU). The feedback sessions focused on positive affect and its contextual embedding (daily life activities, events and social situations) and was given verbally, written, and graphically (in pie charts and bar graphs) to the patient. The MAT-based feedback intervention was compared to MAT-monitoring only (i.e. without feedback; pseudo-experimental group) in addition to TAU, and to TAU only (control group). Outcome measures were changes in positive and negative affect. Preliminary analyses suggest that, during the six intervention weeks, patients in the experimental MAT-based feedback condition show a larger increase in positive affect than individuals in the pseudo-experimental group. In contrast, individuals in the pseudo-experimental condition show a larger decrease in negative affect towards the end of the intervention than individuals in the experimental MAT-based feedback group. First analyses tentatively suggest that providing personalized feedback on daily life collected through MAT-based monitoring may help increase positive affect in depressed patients.

Elementary school children's working memory fluctuations in the school context

Dirk, J.D.

Education and Development, German Institute for International Educational Research, Frankfurt, Germany

It seems to be widely accepted that children as well as adults have their good and bad days of cognitive performance and in consequence have more or less difficulties in being attentive and performing well on cognitive tasks, standardized tests, or exams. However, few studies have systematically studied daily fluctuations in children's cognitive performance in natural settings. One of the most important cognitive capacities for the development of fluid intelligence and school achievement is working memory. The role of working memory (WM) in the school context so far has been investigated only at the between-person level that is, addressing presumably stable differences between children. As studies with adults show, however, WM capacity can also vary systematically from day to day or across occasions within days. The FLUX project aims at quantifying such fluctuations and investigating their antecedents and consequences. In the present study, 110 3rd and 4th graders were assessed on several blocks of one numerical and one figural-spatial WM updating task across four weeks for three sessions per day (at the beginning and the end of school, and in the afternoon) using smartphones. Applying multilevel models, we will first show that reliable fluctuations at the block-to-block, occasion-to-occasion, and day-to-day time-scale exist, as well as individual differences in the amount of such fluctuations. In a second step, we will explore the relationship of these fluctuations to fluid intelligence and school achievement. Taken together, we will demonstrate that working memory tasks on smartphones allow for the reliable assessment of cognitive performance differences between children as well as systematic variation in performance within children over time. We conclude that working memory fluctuates reliably from day to day and within days in elementary school children and argue that these performance fluctuations need to be taken into account when considering school achievement.

Effect of previous-day stress levels on mental fatigue and reduced motivation – the moderating role of sleep quality

Doerr, J. M.D.

Clinical Biopsychology, University of Marburg, Marburg, Germany

Background: Fatigue is among the most prevalent and debilitating symptoms. A relatively novel aspect in the study of fatigue is that it may be conceptualized as a multidimensional construct (e.g. mental and physical dimensions). Stress is known to be a risk factor for fatigue. This has been shown using retrospective questionnaires, but there is also evidence that similar findings may be observed in everyday life on a day-to-day level. Furthermore, sleep quality was shown to be associated with fatigue, and was also found to be influenced by stress. In our study, we investigated the impact of previous-day stress levels on fatigue measured on five dimensions in a momentary assessment ambulatory study. Additionally, the moderating role of sleep quality was examined. Methods: Fifty healthy students (31 females, 23.6±3.2 years) took part in the study. They provided momentary data (at awakening, 10am, 2pm, 6pm, and 9pm) during 5 days of preparation for their finals (exam preparation week) and during 5 days of a regular semester week (control week). Further, participants were instructed to collect saliva samples at respective time points with an

additional sample 30 min after awakening. Subjective data were collected with pre-programmed iPods. Five items assessed fatigue on 5 dimensions: general fatigue ("At the moment, I feel fatigued"), reduced motivation ("At the moment, I feel unable to motivate myself"), reduced activity ("At the moment, I feel active"), mental fatigue ("At the moment, I can concentrate well"), and physical fatigue ("At the moment, I cannot take on a lot physically"). Stress level ("I feel stressed out") was also measured at the respective time points. Sleep quality was assessed via self-report at the time of awakening ("How restorative was your sleep last night?"). Data were analyzed by hierarchical linear modeling accounting for the longitudinal design and nested data structure. A time-lag variable was included in the analyses to assess the effect of previous-day stress on sleep quality and fatigue. Furthermore, an interaction term of previous-day stress and sleep quality was built to assess the moderating effect of sleep quality. Sex, body mass index as well as chronic fatigue level were controlled for statistically. Results: Previous-day stress was associated with low sleep quality ($p<.001$). Sleep quality was a significant predictor of all fatigue dimensions (each $p<.001$). Previous-day stress predicted reduced motivation ($p=.015$) and mental fatigue ($p=.022$), interacting with sleep quality (interaction effects $p=.022$ for mental fatigue, $p=.028$ for reduced motivation). There was no association between previous-day stress and any other fatigue dimension. Explorative post-hoc analyses using a tertile split show that the effect of previous-day stress on mental fatigue was still significant ($R^2=.039$, $p<.001$) for nights with lowest sleep quality, but only significant by trend for medium sleep quality ($R^2=.006$, $p=.078$) and failed to reach significance for nights with highest sleep quality ($R^2=.002$, $p=.364$). The same could be found concerning the effect of previous-day stress on reduced motivation ($R^2=.111$, $p<.001$ for lowest sleep quality, $R^2=.006$, $p=.086$ for medium sleep quality and $R^2=.002$, $p=.364$ for highest sleep quality). Chronic stress turned out to be a predictor of all fatigue dimensions (each $p<.001$, respectively). Mental fatigue was more affected by sleep quality during the exam preparation than during the control week (interaction effect $p=.008$). The other effects were independent of control or exam preparation week. Discussion: Our data suggest that previous-day stress is associated with increased mental fatigue as well as reduced motivation, but not with more physical dimensions of fatigue. The effects of previous-day stress on mental fatigue and reduced motivation turned out to increase with decreasing sleep quality. Thus, sleep quality seems to alter the effect of stress on these fatigue dimensions the next day. To assess possible biological mechanisms underlying these effects, cortisol analyses of the saliva samples are currently in progress and will be reported at the conference. A possible cognitive mechanism for the detected effects might be bedtime rumination or worrying, which should be assessed in more detail in future studies. Also, an objective approach (e.g. ambulatory polysomnography) in addition to subjective estimation of sleep quality might be of interest. Intervention studies should now evaluate the effect of stress management and improvement of sleep hygiene skills on mental fatigue and motivation.

The road to hell is paved with good intentions - Ambulatory Assessment Intervention (AAI) to reduce procrastination in academic settings – A pilot study

Dominok, E. [1] ; Löffler, S.N.[1] ; Panagiota, A.[1] ; Hey, S.[1] ; Gidion, G.[2]

[1] *House of Competence, Karlsruhe Institute of Technology, Karlsruhe, Germany*
[2] *Institute of Vocational Education, Karlsruhe Institute of Technology, Karlsruhe, Germany*

INTRODUCTION Procrastination is a chronic pattern of delaying necessary but unpleasant tasks and activities. A central feature of procrastination is the gap between intention and action behavior. While the intention formation is taking place, the subsequent action is deferred. Ambulatory Assessment (AA) allows the continuous behavioral monitoring of daily life experience. Since procrastination is considered as time-dependent phenomenon (the behavioral pattern changes as a function of time remaining up to the deadline), AA is the method of choice in characterizing this dynamic process. We investigated the feasibility of technology-assisted interventions in the every-day-life of academic procrastinators in order to bridge the intention-action-gap. Three objectives were of particular interest: Does a training of volitional competences show a positive effect on procrastination? How can procrastination be operationalized as a time-dependent process using AA? Efficacy of interactively triggered AAIs on mood as intervening variable? METHODS A sample of 34 students (f=11; m=26; 23.3 ± 2.6 years; 4.7 semester ± 3.5, ranging from 1 to 16) participated in a randomized control trial. During the first week, the baseline assessment of procrastination behavior by using methods of AA took place, followed by two days of training of volitional competences. In a 7-day AAI period, participants were encouraged to conduct brief interventions depending on given information of their current mood and actual goal achievement. The subjective procrastination had been documented by means of the Tuckman Procrastination Scale (t1 to t4). The AA operationalization of procrastination was provided by two variables: planning accuracy (difference between planned and actual learning time as assessed over time and at the end of each day) and effectiveness of time-use (ratio between effective and actual learning time as assessed at the end of each day). The baseline assessment included a maximum of 8 queries per day. The first query comprised questions about the main objective, the included subgoals for the day and the planned time for each task. Context variables and assessment of the current mood state followed. Any further query included subgoal-time-alignment. Each day was terminated with a night mode, which included questions about the actual and effective learning time. The following AAI phase has been supplemented by an interactive aspect ("Did you achieve what you have planned in conjunction with your target-related task for the last 2 hours?" – YES: suggestion for self-reward, end of query; I HAD MADE NO PLANS FOR THE PAST TWO HOURS: end of query; NO: AAI). Subsequently, a short-scale to measure basic dimensions of mood (Calmness, Valence, Energetic Arousal) was used. If the response of the subject fell below a critical value in at least one of the dimensions, an associated intervention was triggered: a soothing imagination (calmness), a physical activation (energetic arousal) or emotion regulation (valence). After each intervention, the short scale was presented again. RESULTS A two-factor repeated analysis of variance revealed significant main effects for measurement (F=13,235; df=1,753; p=.000; ?2=.306) and group factor (F=18,192; df=1; p=.000; ?2=.377) as well as a significant interaction effect measurement*group (F=9,127; df=1,753; p=.001; ?2=.233). The questionnaire data showed a significant decrease of procrastination in the experimental group but not in the control group. Unfortunately, the operationalization of procrastination concerning its dynamics with AA seems to be problematic. This method of assessment is prone to missings and we received no statistically usable material: since differences between pairs of data are considered to show the process running, an absence of one of the two data

points leads to a gap in the data record. Even worse, when the night mode is missing, it is not possible to operationalize procrastination based on the variables mentioned above. Encouraging, there is evidence for the effectiveness of the AAIs on restlessness, fatigue and bad mood. Although inferential analysis of the data is not allowed due to a too small number of cases per cell, descriptive facts suggest differential effectiveness of the AAI on their respectively assigned scale. DISCUSSION AND CONCLUSION According to the questionnaire results, the training was effective, even though it was only short-time training. The operationalization of procrastination as a time-dependent behavior requires further research. The development of appropriate assessment strategies is in progress. Nevertheless, the use of brief interventions seems to have positive effects on mood, which in turn is an intervening variable in terms of procrastination behavior and is quite promising.

Interactive ambulatory assessment - An approach to optimize the sampling strategy in real time

Ebner-Priemer, U.W.

House of Competence, Karlsruhe Institute of Technology, Karlsruhe, Germany

Common sampling strategies in Ambulatory Assessment are: a) time-based sampling strategies (e.g. every hour, or six random assessments during the day), b) event-based sampling strategies (e.g. following each interpersonal event), and c) continuous monitoring (e.g. sampling the electrocardiogram at 512 Hz). Interactive sampling is rarely used but a very promising strategy. In Interactive Ambulatory Assessment a continuous monitoring is combined with real-time analysis of the monitored signals. Essentially e-diaries a triggered, when predefined events or thresholds are passed. The purpose of the interactive assessment approach is to maximize the variance sampled in everyday life. A basic example may help to understand the rationale behind this strategy. Imagine your research interest is the relation between physical activity and mood in everyday life. Your hypothesis is, that physical activity will increase mood. Unfortunately episodes of physical activity are rare in modern societies. A time based sampling strategy (e.g. randomly every 75 minutes) might fail to catch this rare episodes. As mentioned above, Interactive Ambulatory Assessment combines a continuous monitoring with real-time analysis of the monitored signals. In our example, physical activity would be monitored and analyzed in real time. Episodes of interest would be identified online and would be used as triggers for e-diary assessments. For our example (relation between physical activity and mood) this would result in e-diary assessments during all episodes of physical activity and during episodes of non-activity for comparison. This results in a maximization of variance of the interesting phenomena (physical activity) in everyday life, improving the chance to detect associations between the two parameters (in our case physical activity and mood). Three studies using Interactive Ambulatory Assessment will be reported illustrating the possibilities of Interactive Ambulatory Assessment. In study 1 we applied the additional heart rate (aHr), a procedure developed by Michael Myrtek, to trigger e-diaries. aHr is defined by heart rate increases which are not accompanied by increases of physical activity and therefore labeled as emotional physiological arousal. We will present already published data from 50 healthy controls and 50 patients (borderline personality disorder) illustrating the methodology and showing the relation between aHr and psychological variables assessed with e-diaries. In study 2 we investigated the relation between physical activity and mood (see example above). Physical activity was monitored and analyzed in real time and pre-defined thresholds were used as triggers for e-diary assessments. We will report already published data from 70 participants illustrating the possibility to maximize variance with this methodology. In study 3 we are interested in

urban risk mechanisms for mental illness. It has been hypothesized lately that urban characteristics, like traffic, population density, etc., are specific risk mechanisms for mental illness. To investigate the relation between individual exposure to these urban characteristics and stress, we monitor geographic position via GPS and trigger e-diaries when participants are faced urban characteristics of interest. Pilot data will be reported. In summary Interactive Ambulatory Assessment can optimize the sampling strategy in real time to get a closer look at the phenomena of interest.

Dynamic assessment of complex phenotypes: Applications for ambulatory monitoring in candidate gene studies

Finan, P.

Johns Hopkins University School of Medicine, Baltimore, USA

Behavioral scientists are increasingly interested in the study of genetic association with complex behavioral disorders. Complex behavioral disorders are comprised of an array of psychological, biological, and environmental features that may be characterized as complex phenotypes. It is generally accepted that genetic factors account for some portion of variance in the development and maintenance of a variety of complex phenotypes, including those associated with substance use disorders, depression, and chronic pain. However, studies that have demonstrated genetic association with these, and other complex phenotypes, have performed poorly on replication, calling into question the reliability and validity of the observed effects. As the field has swiftly advanced in the methods used to measure genes, the measurement of phenotypes has received less attention. Indeed, attention to the phenotypic characterization of complex processes relevant to complex disorders may improve the reliability and validity of genetic association in psychological science. Ambulatory monitoring offers a novel approach to measuring time-variant and situation-dependent intermediate phenotypes that may build upon knowledge gained through genome-wide techniques employed for gene discovery. Recent examples of the use of ambulatory monitoring in genetic studies of stress reactivity, chronic pain, alcohol use disorders, and psychosocial resilience will be discussed in an effort to highlight the benefits of ambulatory monitoring for genetic study designs.

Maternal pre-pregnancy body mass index and their children's blood pressure and resting cardiac autonomic balance at age 5-6 years

Gademan, M.G.[1] ; Van Eijsden, M.[2,3] ; Roseboom, T.J.[4,5] ; Van der Post, J.A.M. [5] ; Stronks, K.[1] ; Vrijkotte, T.G.M.[1]

[1]*Department of Public Health, Academic Medical Center, University of Amsterdam, Amsterdam, The Netherlands*
[2] *Department of Epidemiology, Documentation and Health Promotion, Public Health Service of Amsterdam (GGD), Amsterdam, The Netherlands*
[3] *Department of Health Sciences, VU University Amsterdam, Amsterdam, The Netherlands*
[4]*Department of Obstetrics and Gynaecology, Academic Medical Center, Amsterdam, The Netherlands*
[5]*Department of Clinical Epidemiology, Biostatistics and Bioinformatics, Academic Medical Center, Amsterdam, The Netherlands*

Background Adverse intrauterine conditions can program hypertension. Because one of the underlying mechanisms is thought to be cardiac autonomic balance, we investigated the association between pre-pregnancy BMI (pBMI) and blood pressure (SBP, DBP) and indicators of the autonomic balance in the child at age 5-6 years. Also investigated was whether these associations were mediated by standardized birth weight and child BMI. Methods Pregnant women (n=3074) participating in the ABCD study completed a questionnaire at gestational week 14. At age 5-6 years, offspring's sympathetic drive (PEP; pre-ejection period), parasympathetic drive (respiratory sinus arrhythmia; RSA) and heart rate (HR) were measured by electrocardiography and impedance cardiography at supine rest (6 min). Blood pressure was assessed simultaneously. As no proof was found for departure from linearity, linear regression models were used to investigate the association between maternal pBMI and SBP, DBP, HR, RSA and PEP.In the basic model, adjustments were made only for the child's sex, height and age at the time of outcome measurement. Subsequently, we adjusted for maternal characteristics that could confound the association knowing ethnicity, gestational age, maternal age, maternal education, maternal height, hypertension during pregnancy, parity and smoking. Then, standardized BW was added to investigate the role of intra-uterine growth in the postulated associations. Finally we added the child's BMI at age 5-6 years Results Obesity (BMI >30) was prevalent in 5.2% of the mothers and 16.2% were overweight (BMI: 25-29.9). After adjusting for possible maternal/offspring confounders, pBMI was positively linearly associated with DBP (ß:0.11 mmHg, 95%CI;0.05-0.17), SBP (ß:0.14 mmHg, 95%CI;0.07-0.21), but not with HR, PEP or RSA. After adding birth weight and child BMI to the model, the association between pBMI and DBP (ß:0.07 mmHg, 95%CI;0.01-0.13) remained significant, whereas a trend was found between pBMI and SBP (ß:0.07 mmHg, 95%CI;0.00, 0.14). Birth weight did not mediate these relationships, but was independently and negatively associated with SBP and DBP. Child BMI was positively associated with SBP and DBP and partly mediated the association between pBMI and blood pressure. Conclusions Higher pre-pregnancy BMI is associated with higher blood pressure in the child (aged 5-6 years) but does not seem to be due to early alterations in resting cardiac autonomic balance. Child BMI, but not birth weight, mediated the association between pBMI and blood pressure.

Ambulatory assessment methods as an approach for detecting hyperactivity symptoms in children and adolescents at risk for and with diagnosed ADHD

Gawrilow, C.[1] ; Langguth, N.[1] ; Guderjahn, L.[2] ; Schmid, J.[1] ; Stadler, G.[3]

[1] *DIPF, Frankfurt, Germany*
[2] *Goethe University, Frankfurt, Germany*
[3] *Columbia University, New York, USA*

Background. Children and adolescents with attention deficit-/hyperactivity disorder (ADHD) suffer from symptoms of inattentiveness, impulsivity, and hyperactivity. Thus, children and adolescents at risk for and with diagnosed ADHD are assumed to be significantly more active than children and adolescents without ADHD (Dane, Schachar, & Tannock, 2000). However, it is not clear yet whether objectively measured physical activity reflects subjective perceptions of hyperactivity in children and adolescents at risk for and with ADHD. Therefore, the present studies aimed at investigating the within- and between-person links between engagement in physical activity (of various intensities) and self-reported hyperactivity in children and adolescents at risk for and with ADHD. Design. Studies 1 and 2 both followed an intensive longitudinal design integrating daily diaries and accelerometers for nine consecutive

days. Measures. Physical activity was measured with accelerometers (ActiGraph GT3X+) and participants rated their hyperactivity in daily evening diaries (Conners 3TM self-report form, 2008). Participants. In Study 1, 82 adolescents at risk for ADHD (M-age = 17.66 years, SD = 3.31; 64.6% male) participated. In Study 2, 46 children and adolescents with diagnosed ADHD (M-age = 14.19 years, SD = 2.23; 89.1% male) participated. Results. In Study 1 with adolescents at risk for ADHD, we found a within- and a between-person link between engagement in light-intensity physical activity (LPA; Treuth et al., 2004) and self-reported hyperactivity, $t(356) = 3.08$, $p < .01$, and $t(77) = 2.48$, $p < .05$, respectively. Participants reported higher hyperactivity on days when they showed more light-intensity physical activity than usual (more LPA minutes per day than usual, within-person link). Participants with higher hyperactivity ratings across all days engaged in more light-intensity physical activity than participants with lower hyperactivity ratings (between-person link). In Study 2 with children and adolescents with diagnosed ADHD, greater subjective perception of hyperactivity was related to more daily steps, again on the within- and between-person level. On the within-person level, on days with higher-than-usual hyperactivity participants took more steps, $t(264) = 5.66$, $p < .001$; being 1 point higher than usual in self-reported hyperactivity was accompanied by 2.588 extra steps per day. On the between-person level, participants with higher self-reported hyperactivity took more steps per day, $t(42) = 3.01$, $p < .01$; participants who scored 1 point higher on self-reported hyperactivity than other participants took 2.638 steps more per day. Discussion. In two studies we demonstrated within- and between-person links between physical activity (i.e., light-intensity activity, steps) and self-reported hyperactivity in children and adolescents at risk for and with diagnosed ADHD. Thus, the more active children and adolescents were during the day (as measured with accelerometers) the more hyperactivity symptoms they reported in the evening. Theoretical and practical implications for the hyperactivity symptomatology in ADHD will be discussed. For instance, we will present an outlook on data regarding hyperactivity fluctuations over the day/week depending on the environment (i.e., school, home) the children/adolescents are in. In addition, we will discuss the possibility to use accelerometers for detecting hyperactivity symptoms in diverse samples (e.g., younger children).

When rumination counts: Signals of safety and heart rate variability in the field

Gerteis, A.S.G. ; Schwerdtfeger, A.R.S.

Department of Psychology, Health Psychology Unit, Karl-Franzens-University Graz, Austria

Objective. Depression and social ties could modulate risk for cardiovascular diseases, which are the predominant cause of death. Although main aspects of depression and social interactions are associated, their possible interconnection is seldom considered. Based on a biopsychosocial model, we aimed to relate the effects of rumination to those of social signals of safety on vagally mediated heart rate variability (HRV) in daily life. Methods. The sample consisted of 117 healthy participants (57% female, mean age = 27.8±5.4 years; mean waist-to-height ratio = .47). Ambulatory HRV (RMSSD), respiration, body position and body movements were measured continuously on 3 consecutive weekdays. Momentary social, situational and cognitive-affective variables (affect; ruminative thoughts; perceived social signals of safety, SoS) were assessed using a computerized diary, which resulted in approximately 28 valid entries per participant. Results. We found a significant interaction between momentary rumination and perceived SoS on ambulatory HRV: When participants were in involved in social interactions without SoS, concurrent rumination was associated with attenuated HRV. However, when rumination was accompanied by perceived SoS HRV

was increased. Furthermore, perceived SoS were associated with elevated vagal tone as compared to being alone, irrespective of ruminative thoughts. Conclusions. These findings suggest a rather complex relation between perceived SoS, rumination and cardiac autonomic control. This stresses the necessity to consider the interplay of psychological and social factors in order to evaluate beneficial or adverse effects on the cardiovascular system.

The investigation of brain functions in ecological settings using electroencephalography. A methodological challenge and perspective

Hill, H.

Department of Sport and Sport Science and House of Competence, Karlsruhe Institute of Technology, Karlsruhe, Germany

The investigation of brain functions with noninvasive methods like functional magnetic resonance imaging (fMRI), magnetencephalography (MEG), electroencephalography (EEG), near infrared spectroscopy (NIRS), and transcranial magnetic stimulation (TMS) is typically limited to laboratory settings. This is because the systems are very large and cannot be moved and head movements must be avoided (fMRI, MEG), or head and body movements generate large movement artifacts. To investigate brain functions in ecological settings (e.g. cognitive or neuropsychological processes in interaction with a natural environment in healty subjects and ambulant patients; movement analysis in sports) portable systems are required. In principle, NIRS and EEG measures are suited for this purpose because the sensors are small and fixed to the head (and not the head is fixed to the sensor) and the necessary electronics and recording devices can be build small enough. NIRS, like the fMRI, measures the hemodynamic response related to specific brain processes with a low temporal resolution. Furthermore, it can measure activity only in cortical layers close to the skull. EEG, especially event-related potentials (ERP) measures, have a high temporal resolution but a limited spatial resolution. However there are several advantages which makes the EEG to the method of choice. Conventional EEG systems are very sensitive to mechanical (cable and electrode movements) and physiological (EMG of head and neck muscles, sweating) movement artifacts. Although advanced data preprocessing algorithms can be used to correct or eliminate such artifacts, the data loss is very high (e.g. Gramann et al. 2010). Therefore, the method of choice is to avoid the generation of mechanical artifacts beforehand by technical modifications. This approach was used in two pilot studies, using different equipment to measure ERPs during ergometer rowing. Especially for analysing movement related brain activity with ERPs rowing is well suited. It is a cyclic movement with a high number of repetitions and the degrees of freedom of the movement are limited by biomechanical constraints. In study one a small, purpose-built 20-channel system was used with a preamplifier connected to the head and electrodes with shortened and fixed cables mounted to a standard electrode cap. This approach excluded successfully the generation of artifacts due to cable and electrode movements. The second approach was the use of active electrodes with built-in preamplifiers (acticap system, www.BrainProducts.com) and wearing the amplifier in a backpack. This system suppresses artifacts due to cable movements, however electrode movements cannot be avoided completely. Applying a standard visual oddball paradigm during rowing and in a non-movement condition, revealed comparable visual and cognition-related (P300) ERPs, using both systems. However, data quality was only sufficient when the stimuli were delivered randomly, i.e. not time-locked to the rowing movement. EEG segments time-locked to the rowing movement still showed large artifacts which requires further improvements in the

measuring system. In summary, these results revealed that it is possible to measure ERPs when the subject is moving, especially when it is considered that head acceleration is several times larger when rowing on a stationary ergometer compared to rowing in a racing shell. A main disadvantage of the two systems used was the amount of required equipment and the data transmission via cable connections. Very promising, therefore, is the availability of newest developments in hardware, like the Emotiv system (www.emotiv.com). This system integrates the hardware in a small and lightweight headset, in combination with a wireless data transmission via an USB dongle to a laptop or even an Android smartphone (Stopczynski et al, 2011). Using such a system with some modifications in sensor quality and location (Debener et al. 2012) seems to be very promising for movement research, and for the investigation of cognitive and neuropsychological processes in more realistic environmental conditions outside the laboratory. On the other hand, new paradigms have to be developed or laboratory paradigms have to be modified to investigate pathologic and nonpathologic brain functions under ambulatory conditions. Therefore, derived from laboratory settings, EEG measures should be combined with tasks or stimuli presented to the subjects which generate specific brain responses. As a less artificial alternative, brain responses and motor activity (e.g. using accelerometry) related to the processing of relevant environmental cues (sounds, visual cues) could be investigated. These environmental data could be recorded with microphones and small cameras or eye-tracking glasses. The events which are necessary to compute ERPs can be extracted post-hoc from the behavioral data which is another great advantage of EEG measures (Hill & Raab, 2005).

Indexing emotion regulation ability in the field: Comparison of laboratory-based measures to real-life data.

Hoffmann, J.M.J. ; Wilhelm, P.

[1]*Clinical Psychology and Psychotherapy, Department of Psychology, University of Fribourg, Switzerland*

Heart rate variability (HRV) has been proposed as an index of an individual's ability to flexibly adapt to personally relevant environmental demands and thus as a potential index to emotion regulation (ER) capacity. On the level of phasic changes, laboratory studies have been widely used to underpin this idea, however, ecological validity of these unrepeated laboratory-based measures is obviously low and hence its equivalence to reactivity in real-life conditions is still under debate. Comparing reactivity in a standardized paradigm to data from a 24h ambulatory assessment might prove a useful way of assessing questions of validity. Research Question Focusing on phasic changes in HRV, we aim at answering two questions: 1) Do phasic changes of HRV in reaction to ER tasks under different levels of physical activity resemble changes to comparable real-life events? And 2) do tonic individual differences in HRV predict individual ER capacity in laboratory-based tasks, as well as in real-life situations? Method A total of 24 undergraduate students participated in a 24 hour monitoring of ECG and physical activity. Prior to and immediately after ambulatory monitoring, subjects completed a standardised set of standardized tasks demanding ER under different levels of physical activity. During wake periods, self-report data was collected using an hourly diary. Results and Conclusion Data screening reveals differences in reactivity to laboratory tasks, as well as self-reported straining real-life events. Subsequent analysis will have to confirm whether these resemble each other and to which extent tonic individual differences in HRV influence phasic reactivity. Hence, comparing laboratory-based measures to real-life data provides useful insights into whether HRV might serve as an index of ER.

Social behaviour and mood in individuals at risk for depression: Investigating the role of serotonin

Hogenelst, K. ; Aan het Rot, M.

Department of Psychology, University of Groningen, Groningen, The Netherlands

Introduction: Good social interactions are important for mental and physical health. Individuals who are depressed often show significant distress or impairment in social functioning. Further, there is evidence that individuals at risk for depression, while their overall social functioning is normal, might display subtle abnormalities in the processing of social cues that could contribute to their depression risk. The neurotransmitter serotonin is involved in the processing of these social cues, which is interesting given the postulated role of low serotonin in the development of depression. In the present study brain levels of serotonin are increased experimentally in individuals at risk for depression. Its effects on social functioning are measured using a form of ecological momentary assessment. Methods: Participants are first-degree relatives of patients diagnosed with a clinical depression. Using a double-blind crossover design, 40 participants will take tryptophan (3 g/d) and placebo for 14 days. Tryptophan is the amino acid precursor of serotonin. During the experiment they record how they feel, behave, and perceive others while interacting with others in their normal everyday lives, using a form of ecological momentary assessment known as event-contingent recording. Mood is assessed in terms of positive and negative affect experienced during social interaction events. Social behaviours and perceptions of others are assessed in terms of quarrelsomeness-agreeableness and dominance-submissiveness. Hypotheses: Tryptophan (1) decreases levels of negative affect and increases levels of positive affect, (2) decreases quarrelsome behaviours and increases agreeable behaviours, and (3) improves perceptions of others' behaviours. Relevance: The study results will provide insight into the role of serotonin in regulating the social functioning of individuals at risk for depression. They may foster future studies in clinical populations.

Rumination in everyday life and its interpersonal associations in couples: a dyadic ambulatory assessment study

Horn, A.B.[1] ; Debrot, A.[2] ; Perrez, M.[2]

[1]*Psychopathology & Clinical Intervention, University of Zürich, Zürich, Switzerland*
[2] *Clinical Psychology, University of Fribourg, Fribourg, Switzerland*

Rumination as a form of unconstructive negative, repetitive thinking is known to be a maladaptive emotion regulation strategy for the individual. However, less is known about the interpersonal effects of ruminative moments in everyday life and their situational impact on interpersonal processes. The current study aims at exploring effects of rumination on momentary affect and psychological intimacy in romantic relationships. 102 couples took part in a dyadic ambulatory assessment study including 4 entries during 7 days reporting momentary affect and feelings of intimacy as well as rumination since the last entry. Multilevel based Actor Partner Interdependence Models show that rumination in everyday life is not only associated with worse momentary affect in the ruminating person but also in the male partner. Furthermore, there are pronounced actor and partner effects of rumination on current perceived psychological intimacy towards the partner: i.e. in situations, in which rumination was reported, not only the ruminating individual reported less closeness towards the partner but also the partner felt less closeness in the

relationship. Ambulatory assessment in couples' everyday life allows to look at situational associations of maladaptive emotion regulation strategies not only with own but also with the partner's affective states. The observed interpersonal effects of intraindividual rumination go in line with the assumption of the importance of interpersonal processes in the development and maintenance of depressed mood.

Induced attention focusing in daily life: an ambulatory assessment study in remitted depressed patients and healthy controls

---

Huffziger, S.[1] ; Ebner-Priemer, U.W.[2] ; Zamoscik, V.[3] ; Reinhardt, I.[4] ; Kirsch, P.[3] ; Kuehner, C.[1]

[1] *Department Psychiatry and Psychotherapy, Central Institute of Mental Health, Mannheim, Germany*
[2] *House of Competence, Karlsruhe Institute of Technology, Karlsruhe, Germany*
[3] *Department Clinical Psychology, Central Institute of Mental Health, Mannheim, Germany*
[4] *Department of Biostatistics, Central Institute of Mental Health, Medical Faculty Mannheim, Heidelberg University, Mannheim, Germany*

Background: Rumination has been proposed as an important cognitive risk factor for depression, while mindful attention is supposed to have protective effects. Experimental studies have supported differential effects of these two forms of emotion regulation in the lab, but their ecological validity is underinvestigated. The present study is the first to induce ruminative and mindful attention in daily life and to examine their effects in a clinical and a parallel nonclinical sample. Method: 34 remitted depressed patients with at least two previous episodes and 32 age-, sex-, and education-matched healthy controls took part in a smartphone-based ambulatory assessment over four consecutive weekdays. Participants received inductions of rumination on two days and of mindful attention on the other two days (cross-over design). Inductions lasted for 3 min and were repeated 5 times per day on pseudorandomized time points. Before and after the inductions, participants rated mood (valence, calmness), momentary rumination (focus on feelings/problems, ruminative uncontrollability), and self-acceptance. Results: Hierarchical linear models revealed that the two induction modes exhibited differential effects on valence, calmness, focus on feelings/problems, ruminative uncontrollability, and self-acceptance. Compared to the rumination inductions, induced mindful attention positively influenced all outcomes. Moreover, the two groups differed in the extent to which the two induction modes affected the two rumination facets and self-acceptance. Specifically, the more positive effects of induced mindful attention over rumination inductions were significantly stronger in remitted depressed patients compared to healthy controls. Conclusions: Results confirm overall protective effects of mindful self-focusing compared to rumination on emotional and cognitive processes in daily life. With respect to momentary adaptive as well as dysfunctional cognitions (self-acceptance, rumination), mindful self-focusing seems to be more beneficial in remitted depressed patients compared to individuals without depressive episodes in the past.

Time-varying relationship between momentary perceived stress and hunger on weekdays and weekends

Huh, J.[1] ; Shiyko, M.[2] ; Dunton, G.[1] ; Keller, S.[3] ; Schembre, S.M.[4]

[1]*Institute for Preventive Research, University of Southern California, Los Angeles, USA*
[2]*Department of Counseling and Applied Educational Psychology, Northeastern University, Boston, USA*
[3] *Department of Psychology, University of Hawaii, Manoa, USA*
[4] *Department of Behavioral Science, University of Texas MD Anderson Cancer Center, Houston, USA*

Background: Obesity and its related consequences on health have become global concerns. The high prevalence of obesity is, at least partially, attributed to psychological factors such as stress. Current research generally supports that stress can promote the overconsumption of food through the appetite enhancing effects of cortisol, a glucocorticoid (Adam & Epel, 2007; O'Connor, Jones, Conner, McMillan, & Ferguson, 2008). "Stress eating" has been anecdotally reported to occur during the evening; however, there is no known empirical evidence to support these claims. Most frequently, the relationships between stress and eating behavior have been assessed with retrospective surveys or laboratory experiments. While important, the generalizability of findings from these studies to real-life situations is limited. The overarching goal of the current work was to establish the degree and patterns of the association between stress and hunger based on measures taken in situ with ecological momentary assessments (EMA; Shiffman, Stone, & Hufford, 2008). First, we aimed to evaluate whether the link between day-to-day experiences of stress and elevated levels of hunger emerges with real-time assessments that focus on momentary experiences of individuals. Second, we were interested in examining the dynamic patterns of the association between stress and hunger, hypothesizing that the day cycle and its biological and contextual patterns would influence the strength of the association. Third, we wanted to compare the dynamic patterns of the association between weekdays and weekends to demonstrate potential contextual determinants of the association. Methods: Using mobile phones, EMA data were collected from 45 young adults (Mage=20.7, SDage=1.5; 40% Caucasian, 35.6% Asian/Asian multiracial; 70% women; 30% overweight/obese) as part of the Project TwEATs (Text with Ease Appetite Tracking System; Schembre & Yuen, 2011). Participants were asked to report current perceived stress and hunger using a 10-point scale (How HUNGRY/STRESSED are you on a scale from 1-10? 1=not hungry at all/stressed; 10=extremely hungry/stressed) in response to automated, hourly text-messages during waking hours from 10:00 to 24:00 over the course of 7 consecutive days. A total of 3,815 assessments were collected, ranging from 20 to 127 per person (SD = 22.8). Compliance rates did not vary across gender, weight status, ethnicity, age, weight status, age, or perceived stress levels (ps>.32). Those who reported high levels of hunger, on average, provided significantly fewer number of assessments (r= -.49; p<.01). Analysis: To evaluate the level of the association between momentary assessments of stress and hunger and to examine within-day and across-day dynamic patterns, we employed the time-varying effect model (TVEM; Shiyko, Lanza, Tan, Li, & Shiffman, 2012). TVEM is suitable for EMA data and takes into account the nesting structure of assessments (repeated measures within individuals), unbalanced sampling design, and missing data. As a semi-parametric model, TVEM models the association between two EMA variables in a non-linear fashion, which allows for a detailed exploration of within- and between-day dynamics. Estimated parameter functions inform the degree of the association between stress and hunger across the continuum of the time scale (from 10:00 to 24:00) and compare trajectories for weekdays and weekends. The model was fitted in SAS 9.3 with the %TVEM macro (www.methodology.psu.edu). Results: Our results confirmed that the effects of stress on perceived hunger are generally positive. However, the magnitude of this negative associated depends on the time of the day and whether it is a weekday or a weekend. For weekdays, the strength of the association ranges from -.035 to .213, with peaks in

the relationships between 16:00 and 18:00 and lows around 12:00. In comparison, for weekends, the relationship ranged from -.111 to .426, with peaks and valleys shifting by about 2 hours: the strongest associations 20:00 and 21:00 and weakest around 14:00. Discussion: Our findings support the overall positive association between stress and hunger. However, this relationship is neither consistent over the course of a day or between weekdays and weekend days. Consistent with anecdotal reports, the stress-hunger association is especially evident during late afternoon to evening hours during the week and later in the evening on weekends. This is the first study to empirically demonstrate this association. While more research is needed to determine the long-term impact of these findings on weight control, our findings suggest that interventions aimed at changing maladaptive eating behavior patterns should be targeted at evening hours. Funding: R25CA90956, T32CA009492 and R03-CA171809.

Feasibility and acceptability of personal digital assistant (PDA) with self-monitoring system for type-2 diabetes

Inada,S.[1] ; Yoshiuchi, K.[1] ; Azuma, A.[1] ; Takimoto, Y.[1] ; Iizuka, Y.[2] ; Ohashi, K.[3] ; Kikuchi, H.[4] ; Yamamoto, Y.[5] ; Kadowaki, T. [2] ; Akabayashi, A.[1]

[1]Department of Stress Sciences and Psychosomatic Medicine, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan
[2]Department of Diabetes and Metabolic Diseases, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan
[3]Department of Internal Medicine, National Cancer Center Hospital, Tokyo, Japan
[4]Department of Psychosomatic Research, National Institue of Mental Health, National Center of Neurology and Psychiatry, Tokyo, Japan
[5]Graduate School of Education, University of Tokyo, Tokyo, Japan

It is difficult to change one's lifestyle for diabetes treatment. Self-monitoring is one of the most useful technique for changing a lifestyle. However, self-monitoring of a dietary pattern with a paper-and-pencil (P&P) diary is hardly used in a clinical setting because of difficulty in calorie estimation or burdens of recording food. In addition, it is not possible to know by a P&P diary when patients recorded. In order to overcome these disadvantages of a P&P food diary, we developed an electronic food diary, "SELFOOF", using personal digital assistance (PDA), accuracy of which was confirmed (J Am Diet Assoc 109:1232-1236, 2009). Using this PDA-based food diary, we developed a new self-care system to improve users' adherence to monitoring and enhance their self-efficacy in treatment. The new self-care system was a kind of a self-monitoring system implemented in a PDA consisting of an electronic food diary, a query program for asking mood, hunger, and whether taking a medication, and a record of body weight and blood pressure transferred automatically from a weight scale and sphygmomanometer via Bluetooth. Temporal changes in calorie intake, weight and blood pressure were shown to patients with graphs on the screen of the PDA, which could function as the feedback to patients. Therefore, the main objective of the present study was to investigate the feasibility and acceptability of the new self-care system in diabetes patients. In addition, the secondary objective was to investigate changes in daily calorie intake and body weight after using the new system. Nine diabetic outpatients were asked to keep food recording for 6-months and answer a questionnaire regarding the use of system and self-efficacy in their diabetic treatment. At baseline participants were provided with a 60-minute orientation to the new self-care system. All participants were lent a PDA, a weight scale, a sphygmomanometer, and an instruction manual of the new self-care system. These equipments were returned at the end of the intervention. Participants were instructed to record food consumption, weight, and blood pressure for 6 months. They were also told to visit their

physician regularly and take medications according to their conditions during the intervention. At 6-months of intervention, participants were asked to complete a questionnaire including items with 6-point Likert scale (from 1 to 6) regarding the feasibility and acceptability of PDA-based self-monitoring. The questionnaire also included a blank field which participants were requested to fill in with any comments on the monitoring system. Changes in daily calorie intake and body weight were analyzed using Wilcoxon signed-rank test. This study was performed in accordance with the Helsinki Declaration and the Japanese ethical guidelines for Clinical Research. The study protocol was also approved by the ethical committee of Graduate School of Medicine, The University of Tokyo. After well informed of the study protocol as well as the conflicts of interest, patients signed and submitted a written consent form. Eight subjects completed the study protocol. Regarding feasibility of the system, all subjects except one who retired the intervention gave positive responses as for blood pressure and weight measurement. As for food recording, the responses were mixed. In respect to the menu list provided in the system, six subjects graded three point or below. Regarding self-monitoring, the majority of responses were positive (five or six point). Six subjects showed their strong intention to use the system in the future. Both pros (e.g. usefulness of food dictionary) and cons (e.g. malfunction of automatic data transfer) of the monitoring system were found in the comment field. Daily calorie intake significantly decreased after the 6-month intervention (at baseline: 1742 kcal / day, at 6-months: 1595 kcal/ day; $p = 0.05$) while there was not a significant decrease in body weight. The days for which eight subjects recorded their food intake added up to 1353 days. The input rate in food recording was 77.2%. In conclusion, this study indicates that the new self-care system might be feasible and acceptable in diabetes patients. Yet, there is still a need for its verification through a randomized intervention study.

Resilience disentangled? Results from a momentary assessment study of resilience in the daily life of a general population sample

Jacobs, N.[1] ; Lechner, L.[2] ; Brouwers, A.[2] ; Nijkamp, M.[2] ; Thewissen, V.[1]

[1]*Faculty of Psychology, Open University, Heerlen, The Netherlands, Department of Psychiatry and Psychology, European Graduate School for Neuroscience, SEARCH, Maastricht University Medical Centre, Maastricht, The Netherlands*
[2] *Faculty of Psychology, Open University, Heerlen, The Netherlands*

Background. Research on resilience is expanding over the past two decades, showing its potential influence on health, well-being and quality of life. Resilience is frequently defined as the individual's capacity to bounce back from adversity or stress. However, it is unclear what resilience represents in terms of everyday life emotional processes. Aims. This study examined the association between resilience and respectively positive affect, negative affect, self-esteem, stress sensitivity and reward experience in the realm of daily life. Method. The study sample consisted of 61 women and 11 men of the general population. Mean age equalled 43 years (SD: 15, range:18-69), 79% had a college or university degree. Resilience was assessed online with the validated Dutch adaptation of the Wagnild and Young Resilience Scale, including items such as 'I usually manage one way or another' or 'I can usually find something to laugh about', rated from 1 (totally disagree) to 4 (totally agree). A sum score of the 25 items was constructed ($a=0.85$). The experience sampling method (ESM) was used to collect multiple assessments (10 times a day for 7 consecutive days) of affect, self-esteem and context in the flow of daily life, resulting in 4234 valid observations.

Negative affect was constructed as the weighted mean of 4 negative affect items such as 'I feel lonely' or 'I feel down' (Cronbach's a=0.69). Positive affect was constructed as the weighted mean of 4 positive affect items such as 'I feel happy' or 'I feel satisfied' (Cronbach's a=0.84). Self-esteem was constructed as the weighted mean of 4 items such as 'I like myself' and 'I am good person' (Cronbach's a=0.79). Stress sensitivity was conceptualized as negative affect reactivity to negatively appraised activities, company and events. Reward experience was conceptualized as positive affect reactivity to positive appraised activities, company and events. All ESM items were rated on a 7-point Likert scale ranging from 1 (not at all) to 7 (very). Multi-level regression analyses were carried out with resilience as dependent variable and respectively positive affect, negative affect, self-esteem, stress sensitivity and reward experience as independent variable, corrected for gender and level of education. Results. Higher scores on the resilience questionnaire were associated with increased positive affect (?=0.02, p=0.009) and increased self-esteem (?=0.01, p=0.007). Neither negative affect, nor stress sensitivity and reward experience were found to be associated with resilience Conclusions. Resilience as measured by the Dutch Resilience Scale is expressed as increased positive affect and increased self-esteem in the realm of daily life. Although these findings may help to unravel the complex concept of resilience, these results must be interpreted with caution due to the small sample size of the study. More data are currently gathered to further investigate whether positive affect and self-esteem contribute to resilience independently from each other.

Emotion recognition in psychosis: no evidence for an association with real world social functioning.

Janssens, M.[1] ; Lataster, T.[1] ; Simons, C.J.P.[2,3] ; Van Os, J.[1,3] ; Myin-Germeys, I.[1] ;

[1]Department of Psychiatry and Psychology, School for Mental Health and Neuroscience, Maastricht, The Netherlands
[2]2 GGzE, Institute for Mental Health Care Eindhoven en de Kempen, Eindhoven, The Netherlands
[3] King's College London, King's Health Partners, Department of Psychosis Studies Institute of Psychiatry, London, United Kingdom

Background: Patients with psychotic disorders show impairments in the recognition of emotions in other people. These impairments have been associated with poor social functioning as measured by self-report questionnaires, clinical interviews and laboratory-based tests of social skills. The ecological validity of these tests, however, is low. Associations were examined between emotion recognition and daily life social interactions in 50 patients diagnosed with a non-affective psychotic disorder and 67 healthy controls. Methods: All participants were assessed with the Degraded Facial Affect Recognition task (DFAR), a computer test measuring recognition of emotional facial expressions. Social functioning in daily life was assessed using the Experience Sampling Method (a random time sampling technique) with focus on measures of social context and appraisal of the social situation. Results: Groups differed significantly in the recognition of angry faces, whereas no differences existed for other emotions. There were no associations between emotion recognition and social functioning in daily life and there was no evidence for differential associations in patients as compared to controls. Discussion: Social functioning, when assessed in an ecologically valid fashion, is not sensitive to variation in the traditional experimental assessment of emotion recognition. Real life measures of functioning should guide research linking the handicaps associated with psychosis to underlying cognitive and emotional dysregulation.

Ambulatory Assessment of Stress and Coping among Portuguese Police Officers

Kaiseler, M.[1] ; Rodrigues, S.[1] ; Ribeiro, V.[2] ; Aguiar, A.[2] ; Cunha, J.P.S.[2,3]

[1]*Faculty of Psychology and Educational Sciences, University of Porto, Porto, Portugal*
[2]*Faculty of Engineering, University of Porto, Porto, Portugal*
[3] *INESC TEC, Porto, Portugal*

Police work is one of the most stressful occupations (McCarty, Zhao, & Garland, 2007). There are a variety of individual, job, departmental, and community factors that influence the stressors and strain experienced by police officers (Grawitch, Barber, & Kruger, 2010). The exposure of police officers to potential stress sources over time has been associated with several problems (Kop, Euwema, & Schaufeli, 1999, Violanti & Paton, 2006), affecting not only behavioural (i.e., absenteeism, poorer interactions with the public, fatigue, attitude towards the use of violence; excessive drinking and smoking), but also physical (i.e., cardiovascular diseases, digestive problems), and psychological components (i.e., increased thoughts of suicide, anxiety, depression, post traumatic stress disorder, and burnout). Although stress is an inevitable factor in police work, coping plays an important role in modifying stress responses (Anshel, 2000). Despite the clear need to investigate the relationship between stress and coping among police officers working in real world scenarios, little research was conducted in this area. In opposition, previous studies concentrated on the effects of chronic stress and coping, and relied mainly on self-report measures and cross sectional designs (Anshel, 2000). While it is believed that this research was important to understand the consequences of stress and coping strategies among this population, it did not fully expose the different sources of acute stress, its magnitude based on physiological data, the manner in which police officers react to the stressful stimuli, or how they cope with specific stressors (Violanti & Aron, 1995). Furthermore, these methods failed to monitor within-person variations, daily variations (Bakker & Leiter, 2010) and have been associated with retrospective bias (Nicholls, Jones, Polman, & Borkoles, 2009). To culminate this gap in the literature, our interdisciplinary research team (psychology, biomedical and electrical engineers), worked together on the development of an Ambulatory method to assess stress and coping among Portuguese police officers during daily life experience (Trull & Ebner-Priemer, 2013). The method consists on physiological and psychological measures of stress and coping, combining user-friendly, and non-intrusive technology, adapted to police officers' needs and requirements. The development of the method is currently near completion and has been based on pilot tests conducted among Portuguese police officers in the city of Porto. The method includes the use of a smart phone and the Vital Jacket® (VJ), a wearable bio-monitoring platform in the form of a simple t-shirt that provides real time ECG and 3 axis accelerometer data (Cunha, Cunha, Pereira, Xavier, Ferreira & Meireles, 2010). Data is stored simultaneously in the VJ, and sent to the smart phone, which acts as a gathering unit, collecting also psychological measures of stress and coping, and georeferenced data. In this way, over the course of three full days of work, police officers (n = 20) will use the VJ and the programmed smart phone in their daily tasks. Following the experience of a stressful situation, they are required to push the event button on the smart phone, and automatically a notification will be sent to the VJ isolating physiologic data for further analysis. At this stage, the police officer is also instructed to reply to some programmed questions on his smartphone, including a description of event (list of possible options is provided), rating of stress intensity appraised (likert scale 1 '*not at all stressful*' vs. 5*'extremely stressful'*), and a description of coping strategy selected. Information can be either typed down on the smart phone or added by voice and the procedure takes less than 1 minute. At the end of a working shift, a researcher meets the police officer, and

checks that all the data in the VJ is synchronized with self-reported information. In case any self-report data is missing, the researcher uses the georeferenced information synchronized with the time of occurrence, to facilitate police officer memory recall and complete missing information. Results will provide physiological and psychological measures of sources of stress experienced by police officers during real world tasks, as well as the selected coping strategies for each stressor. Furthermore, since data collection is synchronized with geo-referenced location in the city of Porto, we believe that the system can be useful in detecting problematic areas in the city. It is believed that findings will allow the design of evidence based stress management solutions, developing the health and wellbeing of police officers, developing their performance and increasing the safeguard of the overall community. Finally, it is believed that the method can make a significant contribution to the area of stress and coping Ambulatory assessment. Acknowledgements: Thanks to Mark Macedo for his contribution on the development of the database. This research has received funding from the European Union Seventh Framework Programs ([FP7/2007-2013] [FP7/2007-2011]), under the SCOPE project Grant Number [PCIG10-GA-2011-303880], the Future Cities Project - FP7 Capacities, Grant Number 316296, and from FCT, Portugal (DFRH/BI/51845/2012).

Do psychological factors aggravate and trigger tension-type headache in real life?

Kikuchi, H.[1] ; Yoshiuchi, K.[2] ; Yamamoto, Y.[3] ; Ando, T.[1]

[1]*Department of Psychosomatic Research, National Institute of Mental Health, NCNP, Tokyo, Japan*
[2]*Department of Psychosomatic Medicine and Stress Sciences, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan*
[3]*Educational Physiology Laboratory, Graduate School of Education, The University of Tokyo, Tokyo, Japan*

Tension-type headache (TTH) is one of common primary headaches and psychological stress and negative mood states have been reported as its aggravating factor and a trigger of its acute exacerbation. However, most previous studies were based on recalled self-reports and their ecological validity is not warranted. Therefore, the aim of this study was to investigate the temporal relationships between headache and preceding psychological stress and mood states prospectively in daily lives of TTH patients using computerized ecological momentary assessment (EMA). The subjects were 22 women and nine men with TTH (age 38.4 +/- 10.4 yrs). They wore watch-type computers as an electronic diary for one week and recorded momentary headache intensity, psychological stress and nine items about mood using visual analog scale of 0-100 approximately every six hours, when waking up, when going to bed and at acute headache exacerbations. Anxiety and depression score were calculated in the range of 0-100 from the items about mood. Multilevel path analysis was used to investigate within-individual relationships between preceding momentary psychological stress and mood states and momentary headache intensity, with consideration for autocorrelations of headache intensity and psychological factors as well as relationships between headache intensity and concurrent psychological factors. In order to investigate if acute TTH exacerbation was related to preceding psychological factors, psychological factors recorded at scheduled recordings were compared between when an acute headache exacerbation followed the recording and when it did not. Multilevel logistic regression analysis was also conducted, in which log odds ratio of an acute exacerbation was regressed on each psychological factor (psychological stress, depression and anxiety) recorded at scheduled recordings. Time of day of recording was controlled. All analyses were stratified by time lag between the recordings: -12 = time lags < -9 hours, -9 = time lags <

-6 hours, -6 = time lags < -3 hours, and -3 = time lags < 0 hours. The effect of preceding psychological stress on momentary headache intensity within three hours was significant (path coefficient = 0.128, p = 0.03). The effect of preceding psychological stress was not significant for lags longer than three hours and neither the effect of preceding depression nor the effect of preceding anxiety was significant for any lags. Psychological stress was significantly higher when an acute headache exacerbation followed the recording within three hours than when it did not (37.2 vs. 30.8, p = 0.002). Psychological stress was significantly associated with acute headache exacerbation occurrence within three hours (OR = 1.25 (1.06, 1.47), p = 0.012, for 10 points increment). These results suggested that psychological stress might be an aggravating factor of TTH as well as a trigger of its acute exacerbation. However, they did not support the association between TTH and depression and anxiety.

Ambulatory assessment of psychological features associated with medically unexplained symptoms: Planning a research project

Klaus, K. ; Mewes, R.

Clinical Psychology and Psychotherapy, University of Marburg, Germany

Background: Current classification criteria for somatoform disorders (DSM-IV, ICD-10) primarily focus on medically unexplained somatic symptoms and neglect psychological aspects. However, several psychological characteristics play a central role in the pathogenesis of somatoform disorders. For example, a prolonged attention allocation to bodily sensations, a catastrophizing interpretation of symptoms as signs of severe illness, as well as illness behavior (such as avoidance of physical activity, body checking, and health care utilization) are considered to be relevant for the maintenance of somatoform disorders. According to these findings and further shortcomings of the current classification criteria for somatoform diagnoses, the Somatic Symptom Disorders Work Group of DSM-5 proposed a fundamentally revised diagnosis, the so-called „Somatic Symptom Disorder“ (J 00). The “Somatic Symptom Disorder” is characterized by chronic distressing or disabling somatic symptoms (regardless whether medically explained or not) in combination with an excessive or maladaptive response to these complaints. In this manner, the diagnosis focuses attention on the dysfunctional coping with bodily symptoms. This is expressed in “excessive thoughts, feelings, and behaviors related to these somatic symptoms or associated health concerns” (criterion B), namely “disproportionate and persistent thoughts about the seriousness of one’s symptoms”, “persistently high level of anxiety about health or symptoms” and/or “excessive time and energy devoted to these symptoms or health concerns”. Although an empirical verification of these psychological criteria would be indispensable regarding the validity of the new somatoform diagnosis, there is a lack of evidence about the everyday life relevance of specific psychological features in sufferers from medically unexplained or explained symptoms. Purpose: To evaluate the significance of various cognitive, affective, and behavioral features in the context of somatic symptoms and to analyze the correlative and causal association with impairment and other clinically relevant outcome measures. In this first study, we will focus on persons with mainly medically unexplained symptoms. Method: Patients with medically unexplained symptoms will be recruited via a waiting list of an outpatient psychotherapy clinic. Subjects can be included if they fulfill the classification criterion A (“One or more somatic symptoms that are distressing and/or result in significant disruption in daily life”) and criterion C (“Although any one symptom may not be continuously present, the state of being symptomatic is persistent (typically at least for 6 months)”) of the DSM-5 “Somatic Symptom Disorder”. Furthermore,

data will also be collected in a control group of depressive patients. Patients with somatic symptoms appearing in the context of deviating diagnostic categories (like panic disorder) will be excluded. The study design will comprise two investigations in the outpatient clinic (before and after the ambulatory assessment) and a 10-day ecological momentary assessment. In the course of the two investigations, a diagnostic interview will be conducted and questionnaires (e.g., the Patient Health Questionnaire-15) will be filled in. For the momentary assessment, participants will be surveyed in their natural environments by the use of handheld computers (time-based method, stratified random sampling). During this assessment, questions about occurrence and intensity of somatic symptoms, impairment, and a variety of cognitive, affective and behavioral variables will be asked several times a day. Items will be presented in random order to counterbalance any effect of sequencing. Because of lacking references, some of the adapted or newly developed items will be tested in a pre-study with persons suffering from fibromyalgia to ascertain that they meet all requirements (for example comprehensibility). The ecological momentary assessment data thus obtained will statistically be analysed by means of multilevel models. Due to the fact that this study will still be in the process of planning at the time of the congress, it is explicitly asked for constructive discussion and input.

Frequency of intrusions and flashbacks in patients with posttraumatic stress disorder related to childhood sexual abuse: An electronic diary study

Kleindienst, N.

Central Institute of Mental Health, Department of Psychosomatic Medicine and Psychotherapy, Mannheim, Germany

Intrusions and flashbacks are core features of posttraumatic stress disorder (PTSD). The frequency of these symptoms is usually assessed through retrospective questionnaires, which may be subject to recall bias of unknown magnitude. Electronic diaries that enable real-time assessment have been used to address recall biases in several psychiatric disorders. However, to our knowledge this is the first study to apply this method to assess intrusions and flashbacks in PTSD related to childhood sexual abuse (CSA). Female patients with PTSD related to CSA (n = 28) were provided with electronic diaries for repeated real-time assessment of intrusions and flashbacks over the period of one week. At the end of this period, they were asked to retrospectively report how many such symptoms they recalled having experienced over the past week. The total number of symptoms reported in the electronic diaries (74.5 +/- 62.0 intrusions and 24.4 +/-36.0 flashbacks for the week) was substantially higher than those reported in previous studies. Furthermore, electronic diaries revealed the occurrence of about 50% more intrusions and flashbacks than did the retrospective assessment (74.5 vs. 49.5 for intrusions, and 24.4 vs. 13.4 for flashbacks). Such high frequencies are not captured with existing assessment instruments and suggest a possible ceiling effect. Future research needs to clarify whether these high numbers are specific to highly symptomatic PTSD patients or might generalize to other populations of PTSD patients.

Adolescent internalizing/externalizing problems and the dynamics of feelings

Koot, H.M.

Department of Developmental Psychology, VU University Amsterdam, The Netherlands

Background Feelings reflect the activity of the emotional system (LeDoux, 1998; Scherer, 2000, Bechara, Naqvi, 2004), and can - among others - be characterized according to their associated valence and arousal (Posner, Russell, Peterson, 2005; Russell, 1980), or their implied action tendencies including withdrawal vs approach (cf. Frijda; also see Lang, Bradley, & Cuthbert, 1998). While it is generally assumed that elevated levels of various types of emotions are associated with specific psychopathologies (e.g., sadness with depression), and that poor affect regulation (indicated by variability of feelings) is a main factor underlying the development of psychopathology, little is known on the actual relation between the two major dimensions of adolescent psychopathology internalizing and externalizing, and the levels and dynamics of associated emotions as tapped by reported feelings. Distinguishing primary, secondary, and background feelings, we hypothesized that internalizing problems are associated with elevated levels and increased dynamics of the primary feelings happy (-), sad, and anxious, the secondary feelings guilty and ashamed, and the background feelings tense and tired. By contrast, we expected externalizing problems to be associated with elevated levels and increased dynamics of the primary feelings happy and angry, the secondary feeling proud/arrogant, and the background feelings fit, quiet, and tense (-). Methods Participants were 186 adolescents (49% male) aged 13 to 19 yrs. (mean age 15.5 yrs) for Dutch secondary schools. Adolescents completed the Youth Self-Report (Achenbach, 1991) to assess internalizing and externalizing problems, and using the Electronic Mood Device (EMD; Hoeksma et al., 2000), they rated the intensity of 10 feelings, every hour during 3 to 4 days. The EMD provides a portable electronic version of a mood adjective scale with nine points (1–9). Feelings were presented in random order. Use of the EMD allows for detailed description of the feelings' temporal course, and associated phenomena (e.g., Hoeksma et al., 2007). We obtained a total of 7855 observations (mean =42.2, sd=9.9 per person). Multilevel modeling (yit =ui + ß1.Inti + ß2.Exti + eiijInti + eeij.Exti + eij) was used to test between and within adolescent differences in associations between levels and dynamics of specific feelings and internalizing and externalizing problems (Var(yi)= Var(ei) + Var(ei).Inti + Var(ei).Inti2+ Var(eei).Exti + Var(eie).Exti 2). Results All primary, secondary, and background feelings were significantly associated with Internalizing and Externalizing problems (see Figures 1 and 2). Levels of each feeling showed significant linear associations with levels of internalizing and externalizing problems in predicted directions. While dynamics of feelings were generally significant related to internalizing and externalizing problems, associations were often curvilinear. However, dynamics were generally highest for high comorbid levels of internalizing and externalizing psychopathology. Conclusions Some correspondence is established between theoretically expected and observed feelings. Adolescents with internalizing behaviors are characterized by much variance in many feelings, while adolescents with externalizing behavior had higher levels of and more variance in positive feelings. While 'Internalizers' are characterized by increased levels and variance of happiness (-), sadness, and anxiety, 'Externalizers' are characterized by higher levels of anger, arrogance, and fitness.

Make-or-break: Time pressure, social work stressors and blood pressure in a team of seven IT-workers during one week of intense work

Kottwitz, M.U.K. ; Lachappelle, M.L.; Elfering, A.E.

Department of Work & Organizational Psychology, University of Bern, Bern, Switzerland

Time pressure is common in IT-work – especially in small companies – as the need to meet a specific deadline seems to be one of the most important factors associated with IT-work stress. In addition, the necessity of cooperation in IT-work is high; A group is working together on the same task increasing the risk of social stressors that include tensions and conflicts at work. This study investigates whether time pressure but also social stressors contribute to elevated levels of blood pressure during the day. Repeated ambulatory blood pressure assessments of seven employees (one woman and six men) – staff of a small IT enterprise – was assessed across one week. The participants completed a short questionnaire asking for their general time pressure and social stressors at work at the beginning of the study. Therefore, more precisely analytical methods can be used, since the measurements are not independent of each other and are also available at different levels of analysis. To deal with this data structure, a multilevel approach was indicated. Multilevel regression analyses of 138 blood pressure samples reveal higher levels of time pressure to be related to a marginally significant increase in mean arterial blood pressure at noon and in the afternoon at work. In addition, higher levels of social stressors at work were significantly associated to elevated mean arterial pressure in the afternoon. The association decreases and becomes only marginally significant when controlling for time pressure. The present study highlighted the importance of social work relations and the perception of social stressors within the same IT organization. Persons who perceived comparatively more social stressors at work reveal higher levels of blood pressure – in part independently from time pressure. As elevated ambulatory blood pressure often precedes cardiovascular disease, the findings support the importance of team climate on health within small IT companies, where typically employees work together on the same complex project under tight deadline. This is in line with elaborated conceptual models of threats to the social self – or stress as offence to self – as a potentially important influence on physical health.

Does workload and subjective stress ratings predict blood pressure in bachelor students?

Koudela-Hamila, S. ; Santangelo, P. ; Ebner-Priemer, U.W.

Karlsruher Institute of Technology, Karlsruhe, Germany

Studies investigating stress and workload in students are rare. Even worse, the few studies on stress and workload in students mostly use retrospective reports, but no real time assessment covering psychological and physiological aspects. Multiple studies demonstrated the buffering function of social support on stress and its effects on physiological health. Our goal was to further understand the relationships between psychological self reported workload, stress as well as social support and physiological variables such as blood pressure while controlling for physical activity in students. We assessed self-reported stress and workload as well as physiological markers of stress using ambulatory assessment. 149 Students had to carry Smartphones and were subjected to report their stress, workload and social support every hour during their waking time. One half of the students had to carry 24 hours

blood pressure devices to investigate changes of the cardiovascular system as a possible direct effect of their experienced stress. To control for the influence of physical activity on blood pressure we additionally assessed physical activity using accelerative sensors. We used multilevel modeling to demonstrate the effects of workload, stress as well as social support on blood pressure in students during their daily life. Details on data analysis will be presented and findings will be discussed.

Time-lagged moment-to-moment interplay between negative affect and paranoia: new insights in the affective pathway to psychosis

Kramer, I.[1]; Simons, C.J.P.[1]; Wichers, M.[2]; Myin-Germeys, I.[2]; Van Os, J.[3]

[1] GGzE, Institute of Mental Health Care Eindhoven and the Kempen, Eindhoven, the Netherlands, Department of Psychiatry and Psychology, Maastricht University Medical Centre, Maastricht, The Netherlands
[2]Department of Psychiatry and Psychology, Maastricht University Medical Centre, Maastricht, The Netherlands
[3]Department of Psychiatry and Psychology, Maastricht University Medical Centre, Maastricht, The Netherlands. King's College London, King's Health Partners, Department of Psychosis Studies, Institute of Psychiatry, London, UK

Evidence suggests that affect plays a role in the development of psychosis but the underlying mechanism requires further investigation. This study examines the moment-to-moment dynamics between negative affect (NA) and paranoia prospectively in daily life. A female general population sample (n= 515) participated in an experience sampling study. Time-lagged analyses between increases in momentary NA and subsequent momentary paranoia were examined. The impact of childhood adversity, stress-sensitivity (impact of momentary stress on momentary NA) and depressive symptoms on these time-lagged associations, as well as associations with follow-up self-reported psychotic symptoms (Community Assessment of Psychic E xperiences (CAPE) and the Symptom Checklist (SCL-90-R)) were investigated. Moments of NA increase resulted in a significant increase in paranoia over 180 subsequent minutes. Both stress-sensitivity and depressive symptoms impacted on the transfer of NA to paranoia. Stress-sensitivity moderated the level of increase in paranoia during the initial NA increase, while depressive symptoms increased persistence of paranoid feelings from moment to moment. Momentary paranoia responses to NA increases were associated with follow-up psychotic symptoms. Examination of micro-level momentary experience may thus yield new insights into the mechanism underlying co-occurrence of altered mood states and psychosis. Knowledge of the underlying mechanism is required in order to determine source and place where remediation should occur.

Dealing with daily stress – the buffering role of counting one's blessings

Krejtz, I.[1] ; Nezlek, J.[2] ; Michnicka, A.[1] ; Holas, P.[3] ; Rusanowska, M.[1]

[1] *Psychology, University of Social Sciences and Humanities, Warsaw, Poland*
[2]*Psychology, College of William and Mary, Williamsburg, USA*
[3]*II Psychatric Clinic, Warsaw Medical University, Warsaw, Poland*

Gratitude is broadly defined as the emotion or state of being grateful for various gifts in life such as the presence of cherished others in one's life (Lambert et al. 2009) and as the recognition and appreciation of altruistic gifts (Emmons, 2004). There is growing evidence that feelings of gratitude can have broad positive effects on people. These effects include increased subjective well-being (McCullough et al. 2004) and positive emotions, better health (e.g. Emmons & McCullough, 2003), greater life coherence (Lambert, et al 2009). Although existing research provides valuable insights into the positive effects of gratitude, we know of no study that has examined if gratitude moderates reactions to stressful everyday life events. We addressed this issue in the present study, two-week online diary study in which we manipulated gratitude. Method Participants Participants were randomly assigned to one of two groups. The gratitude group (N = 29, 19 F, Mage = 27.4, SD = 5.78) and the control group (N = 29, 17F, Mage = 28.81, SD = 5.82) did not significantly differed in age and gender proportion. At an introductory session, participants were told about the study and how to use the website. They also completed various questionnaires that will not be discussed here. Online diary Each day for two weeks, participants provided measures of the events that happened each day, their daily affect, and other self-focused measures (e.g., Nezlek, 2012). For daily events participants described important events and categorized them into one of 10 categories (interpersonal, family, partnership and marriage, health and physical symptoms, hobby, work and duties, moral and values, everyday life, contacts with administration, financial). They rated each event on four scales: stressfulness, positivity, importance, and mindfulness using 7-point Likert type scale response scale anchored with 1 = not at all and 7 = very much. For present purposes, we will focus on daily stress as measured by the sum of the stress scores for all the events in a day. Other daily measures consisted of 2-3 items. We kept these measures brief to avoid overloading participants. Daily measures were based upon comparable trait level measures (see Nezlek, 2012). Daily affect was measured using a circumplex model (positive-negative, active-deactive), and in this abstract we discuss only daily self-esteem and daily depressogenic adjustment (based on Beck's triad) of the self-focused measures. Participants used the same 7-point Likert type scale as above. Gratitude manipulation In the gratitude condition, at the beginning of each daily session participants were given the following instruction (based on Emmons & McCullough, 2003): "There are many things in our lives, both large and small, that we might be grateful about. Think back over the day and write down on the lines below all that you were grateful today." Participants were given 6 places to enter the things/events for which they were grateful. Data Analysis and Results For present purposes, we conceptualized the data as a two level hierarchical structure in which days were nested within individuals, and the data were analyzed with a series of multilevel models using the program HLM. The analyses we present here focus on the extent to which the gratitude manipulation moderated within-person relationships between stress and affect, self-esteem, and depressogenic adjustment. To control for the possible influence that gratitude might have had on how stressful events were perceived to be, daily stress was entered group-mean centered. These analyses found that asking participants to focus each day on the things for which they were grateful reduced their reactions to stress. Within-person relationships (slopes) between stress and daily measures of depressognic adjustment, positive-active affect (e.g., happy), positive deactive affect (e.g., relaxed), and negative-active affect (e.g., anxious) were weaker for participants

in the gratitude condition than in the control condition (all ps < .05). Interestingly, there were no significant differences between the experimental and control groups in daily means for these measures. Discussion The results confirmed our expectation that getting people to focus on the things for which they felt grateful would reduce their reactions to daily stress. We expect to conduct more analyses to examine possible explanatory mechanism, e.g., does gratitude lead to a reduction in the perceived importance of stress that in turn is responsible for the moderating effect we have found? *This research was funded with the support of the Foundation for Polish Science, grant Brigde BIS/2011-3/2

Neurobiological correlates of daily-life rumination in remitted depressed and healthy individuals

Kuehner, C.[1] ; Zamoscik, V.[2] ; Ebner-Priemer, U.W.[3] ; Huffziger, S.[1] ; Kirsch, P.[2]

[1] *Department of Psychiatry and Psychotherapy, Central Institute of Mental Health, Mannheim, Germany*
[2]*Department of Clinical Psychology, Central Institute of Mental Health, Mannheim, Germany*
[3]*House of Competence, Karlsruhe Institute of Technology, Karlsruhe, Germany*

Introduction: Rumination, a tendency to repetitively think about negative mood states and their causes and consequences, has been proposed as an important cognitive risk factor for the onset and course of depression. Extensive laboratory work has underscored the detrimental role of rumination on cognitive, emotional, and biological health outcomes. However, there have been few demonstrations of the ecological validity of such findings. Aim of the present study was to combine ambulatory assessment (AA) with functional magnetic resonance imaging (fMRI) to investigate effects of momentary rumination on mood and cortisol activity during daily life and to establish neural activity correlates of daily life rumination in remitted depressed patients (RD) and healthy controls (HC). Method: Thirty-two RD and 32 HC, individually matched by age, sex, and education level, participated in a combined AA/fMRI study. AA of momentary rumination, mood, and saliva cortisol was performed on two consecutive workdays with 10 palmtop-prompted assessments per day. Depressive symptoms and habitual rumination were assessed retrospectively at baseline and at a six-months follow-up survey. Participants also underwent a fMRI paradigm that induced negative mood by the recall of significant negative autobiographical life events during scanning. Results: Higher levels of daily rumination were linked to higher levels of negative mood and predicted higher daily cortisol levels in both samples. A higher connectivity of the default mode network (DMN, seed region posterior cingulate cortex) with the bilateral parahippocampal gyri during negative mood induction was identified in RD, which was even more pronounced in patients with more previous episodes. In RD, a higher connectivity predicted higher levels of rumination and negative mood in daily life and a worsening of depressive symptoms and habitual rumination during the following six-months period. Conclusion: Our study demonstrates that the combination of laboratory and daily life assessments can add important knowledge to possible rumination-related mechanisms that affect mental health outcomes. In our study, rumination in natural contexts affected subjective emotional experience and psychoendocrinological activity during daily life both in remitted and never-depressed individuals. In RD, momentary rumination was shown to be connected to specific alterations in autobiographical processing of negative experiences that may have scar-like properties. Our future work aims to investigate whether a short mindfulness-based attention training is able to influence DMN hyperconnectivity and daily life rumination in remitted depressed patients. This

project was funded by grants from the Deutsche Forschungsgemeinschaft (DFG) to CK (KU1464/4-1) and PK (KI576/12-1).

Individual classification of elementary school children's physical activity: A time-efficient group-based approach to reference-measurements

Kühnhausen, J.K. ; Dirk, J.D. ; Schmiedek, F.S.

Education and Development, German Institute for International Educational Research, Frankfurt, Germany

Objective measurement of physical activity using accelerometers is becoming increasingly popular. There is little consensus, however, about how to analyze acceleration data. Traditionally, the data are transformed to counts, which are in turn summarized for a specific time frame. The resulting measurement – usually counts per minute – is assumed to be directly related to the intensity of an activity. All that is needed are cut-off values that determine which amount of counts per minute corresponds to which intensity. This approach has the shortcomings that there is a lack of (a) a clearly best way to transform acceleration data to counts and (b) universally valid cut-off values to determine the intensity of an activity. One promising alternative is the use of reference measurements in which subjects conduct carefully protocolled activities. This makes it possible to identify data patterns that indicate these activities for each subject. As this is a rather expensive approach, both in terms of time and money, we propose a new approach in which a group of children conducts the reference measurements at the same time. Within the FLUX project, we conducted the reference measurements for a whole class of children in a single physical education lesson. This made it possible to finish the reference measurements with our whole sample of 70 children (age 8-11) in only four and a half hours. The resulting data were classified using support vector machine (SVM) models. We were able to correctly classify the six conducted activities with an accuracy of 96.9% when fitting individual models for each subject. Furthermore, for each subject, a model was fitted on the data of all but that subject and then used to classify his or her data. On average, these models correctly classified the data with an accuracy of 89.7%. These accuracies are comparable to ones reported in previous studies. Conducting reference measurements in groups leads to considerably reduced effort and costs, while not leading to considerably worse classification accuracies, as compared to studies with individual reference measurements. Thus, we propose a method that incorporates the major advantages of reference measurements – that is, analyses individually tailored to each subject - while avoiding its major shortcomings – that is, high costs in terms of both time and money. We conclude that our approach can yield a valuable contribution to studies intended to assess physical activity with larger samples.

Emotional inertia

Kuppens, P.

Research Group of Quantitative Psychology and Individual Differences, KUL-University of Leuven, Belgium

People's emotional lives are characterized by ups and downs, changes and fluctuations following the ebb and flow of daily life. Studying the patterns and regularities underlying these changes offers a unique window on how people emotionally respond to events and regulate their emotions, for better or for worse, and provides crucial information about their psychological well-being or maladjustment. One such pattern is emotional inertia, the degree to which emotions carry over from one moment to the next, reflecting resistance to change. In this talk, I will presents findings from a research program examining the role of emotional inertia in different forms of psychological (ill)health, with a special emphasis on depression.

Combined activity-electronic diary assessment of mood states in a community-based sample

Lamers, F.[1] ; Cui, L.[1]; Swendsen, J.[2] ; Merikangas, K.R.[1]

[1] *Genetic Epidemiology Research Branch, National Institute of Mental Health, Bethesda, MD, USA*
[2] *National Center for Scientific Research, University of Bordeaux, France*

Background/Objective: With increasing evidence that disturbances in homeostatic regulation underlie mood disorders, there has been increasing interest in studying daily rhythms of sleep, activity, mood regulation and stress reactivity. However, there has been limited prospective data on the inter-relationships among these systems. The major objective of this paper is to examine patterns of associations between activity and depression symptoms in a community-based sample of people with mood disorders using concomitant Ecological Momentary Assessment (EMA) and Actigraphy . Sample and Methods: The sample for the present study was 281 individuals from a community based family study of mood spectrum disorders. Activity assessed by wrist accelerometers (Actiwatch) and EMA using a Personal Digital Assistant with 4 electronic interviews per day were administered for a two week period. Interviews included questions on mood, energy, anxiety, daily life events, sleep and appetite. Information from structured diagnostic interviews and supplementary information from first degree relatives was used to assess criteria for DSM-IV mood disorders by a team of experienced clinicians. There were a total of 62 people with lifetime DSM-IV Bipolar disorder, 97 with Major Depression, and 122 without mood disorders. Results: To date, we have collected over 20,000 electronic interviews concerning daily life experiences, behaviors and symptoms in approximately 281 study participants from the NIMH family study. There was a strong bi-directional association between low activity and sad/depressed mood in the period after assessment across the two weeks. This was particularly pronounced for people with a lifetime history of bipolar I disorder but not for those with major depression. Conclusion: The novel use of combined EMA mood assessments and objective assessment of activity through Actiwatches facilitates in vivo assessment of links between activity and emotional states. The findings of more tight linkage between sad mood and low activity in those with bipolar disorder have important implications for activity interventions that could stabilize mood states. In addition, future studies of the relationships of mood and

activity with sleep, environmental stressors, and other emotional states could provide objective evidence for disturbances in biologic rhythms as a potential etiologic mechanism for mood disorders.

Measurement of cognitive failures in everyday life via ambulatory assessment

Lange, S. ; Süß, H.M.

Department of Methodology, Institute of Psychology I, Otto von Guericke University Magdeburg, Germany

For the first time, ambulatory assessment was used to measure cognitive failures. These short, transient, and low frequented lapses in attention or actions can´t be reliable assed by retrospective questionnaires because estimates of relative frequencies over large periods have to be memory biased and probably influenced by personality traits. In order to cover a representative sample of situations where failures might occur and to achieve a valid value of real frequencies, repeated measures are necessary. We developed a new instrument (electronic questionnaire for cognitive failures in everyday life, eKFA) that was applied in an android-based application via mobile phones with four randomized, acoustic alarms per day asking participants to report their failures during the last two hours. The eKFA was administered to 94 older adults who carried the phones for one week and it showed good internal consistency and stability after 6 weeks. Comparisons with a paper-pencil version of KFA demonstrated that we have successfully overcome some shortcomings of earlier instruments, but there is further work needed to convince at validity issues.

Mobile assessment in schizophrenia: a data-driven momentary approach

Lataster, T. ; Oorschot, M. ; Wichers, M.; Myin – Germeijs, I.

[1] *Department of Psychiatry & Psychology, School for Mental Health and Neuroscience, Maastricht University, Maastricht, The Netherlands*

Published in Schizophrenia Bulletin, 2012, vol. 38(3), pp 405-413. Aim: A data-driven momentary approach was used to demonstrate how real-life diary techniques could be utilized for diagnostic purposes in patients with psychotic disorder, providing detailed information on symptom profiles and risk factors at the individual level. Method: The dataset included patients in an acute phase of psychosis and the focus was on paranoia as one of the main psychotic symptoms (30 patients with high levels of paranoia and 34 with low levels of paranoia). Results: Based on individual cases it was demonstrated how (1) symptom and mood patterns, (2) patterns of social interactions or activities, (3) contextual risk profiles (e.g., is being among strangers, as opposed to family, associated with higher paranoia severity?), and (4) temporal dynamics between mood states and paranoia, substantially differ within individual patients across the high versus low paranoid patient group. For the investigation of the temporal relationship between paranoia on the one hand and anxiety/ relaxation on the other, vector auto regressive modeling was applied, allowing for the examination of bidirectional influences without the need to have a priori assumptions about the direction of effects (e.g., does anxiety/ relaxation precipitate or follow the onset of increased paranoia severity?). For 54% of the patients (N=36) at least one of the mood states was associated with paranoia over time, for 23% of the patients (N=15) there was no temporal relationship between either mood state and paranoia, and for 23% of the

patients (N=15) there was not enough variability to assess the association. Most striking, it was shown that individual findings are different from what is found at the overall group level. Some people stay anxious after a paranoid thought came to mind. For others, paranoia is followed by a state of relaxation. Discussion: By surfacing the patient's implicit knowledge about symptom patterns, ESM may provide an excellent starting point for person-tailored psychoeducation and for choosing the most applicable therapeutic intervention

Evidence for a two-factor positive and negative affect structure in daily life: presenting the Maastricht Momentary Mood Questionnaire (3MQ)

Lataster, T. ; Viechtbauer, W. ; Collip D. ; Oorschot, M. ; Janssens, M. ; Van Nierop, M. ; Lothmann, C. ; Wichers, M. ; Myin-Germeys, I.

Department of Psychiatry & Psychology, School for Mental Health and Neuroscience, Maastricht University, Maastricht, The Netherlands

Background: Although data collected with momentary repeated-measure (diary) techniques show superior ecological validity compared to single-assessment retrospective reports, computing reliability indices in daily life measures is less straightforward. A multilevel factor analytic approach (disentangling between- and within-person variance) was adapted in the current study to assess internal consistency of 9 mood items in a large dataset collected using the Experience Sampling Method (ESM). Additionally, the "known groups" technique was used to assess construct validity in this dataset comprising of individuals with different psychiatric backgrounds. Method: Pooled ESM data (daily diary data of 7 different studies, collected over 5/6 consecutive days, with 10 beeps per day) of 1423 individuals contributing to 59034 momentary assessments was used to assess the construct validity, test the factor structure, and examine the –reliability of the following mood-adjectives: cheerful, relaxed, satisfied, insecure, lonely, anxious, irritated, down, and guilty. Confirmatory factor analysis (CFA) was applied to examine the fit of a two- versus one-factor model. Based on the estimated loadings of the items from the CFA models, the reliability of the composites of the mood-adjectives was estimated. All analyses were carried out at the within- and between-person level. Results: The mean intensity of the items thought to reflect negative affect (NA) was largest in individuals with depression, while items thought to reflect positive affect (PA) was lowest in this group when compared to 3 other groups (i.e., psychotic disorder patients, a psychosis risk, and a general population group), supporting the construct validity of the scales. CFA results show a good fit for a two-factor model with the items cheerful, relaxed, and satisfied loading on the PA factor, and insecure, lonely, anxious, and guilty loading on the NA factor both at the within- and between-person level. Since cross-loadings on the PA factor were high for the items irritated and down, these items were removed from the NA factor, after which the model fit increased but reliability slightly decreased. Discussion: Evidence for a clear and reliable two-factor, PA and NA, structure of 7 out of 9 frequently used momentary mood-adjectives was found in the current study. The findings suggest that PA and NA are correlated, but separable and valid constructs rather than the two extremes of one bipolar affect-continuum. Based on the within- and between-subject reliability of these 2 factors, we propose the 7-item Maastricht Mood Questionnaire (3MQ) to be a good measure of affect in daily life.

Empathic accuracy in psychiatric care – A diary study on perceiver and target predictors on momentary affect

Lembcke, H.[1] ; Teich, K.[1]; Rostalski, T.[1] ; Huber, M.[2] ; Stiehm, T.[2] ; Witte, K.[2] ; Zimmerman, J.[2] ; Langosch, J.[2] ; Wilhelm, P.[3] ; Weber, H.[1] ; Kubiak, T.[4]

[1]*Institute of Psychology, University of Greifswald, Greifswald, Germany*
[2]*Bethanien Hospital, Greifswald, Germany*
[3] *Department of Clinical Psychology, University of Fribourg, Fribourg, Switzerland*
[4]*Department of Health Psychology, Johannes Gutenberg University, Mainz, Germany*

Background and aims. In psychiatry the nursing staff's ability to accurately judge the patients' momentary emotional state is of high clinical relevance, e.g. in with regard to the early detection of mood swings. Until now, studies addressing this issue are scarce. We studied empathic accuracy and related moderating effects in a psychiatric inpatient facility using a diary approach. Methods. The psychiatric patient sample consisted of 30 patients (15 female, 15 male) with anxiety, affective and somatoform disorders (age in years: M = 49.93, SD = 9.40; duration of inpatient treatment in days: M = 18.92, SD = 8.72) and ten members oft he nursing staff attending the respective wards (age in years: M = 40.38, SD = 11.72; years of job experience: M = 10.13; SD = 6.41). The patients reported their momentary affect six times a day for five consecutive days with a paper pencil diary following a signal-contingent sampling scheme. Simultaneously, the nursing staff reported their own affect as well as the patients' affect whenever changing shifts. The analytic strategy followed a dyad design approach with mixed regression modeling. Results. Patients' arousal was associated with significant discrepancies and a misjudgment of indicators of depression and mood dynamics. Especially items concerning the activation level of target persons revealed correlations between rating discrepancy and the key indicators of depression, mood dynamics and projection. Gender and dispositional perceiver empathy were significant moderators of empathic accuracy. Concerning the prediction of the affect dynamics of the patients, social setting was identified as a significant influence factor. Conclusions. The findings support the relevance of the empathic accuracy for clinical practice.

Differences in negative emotion differentiation within and between individuals: An application of multilevel latent class analysis

Lischetzke, T.

Department of Psychology, University of Koblenz-Landau, Landau, Germany

The ability to differentiate between discrete emotions with high precision has been termed emotion differentiation. Individuals high in negative emotion differentiation, for instance, distinguish between distinct negative emotions such as anger, sadness, or shame when describing their emotional experience whereas individuals low in negative emotion differentiation describe their feelings along a broad pleasant-unpleasant continuum. Previous research supports the notion that higher emotion differentiation facilitates adaptive self-regulation. Just as there are differences in emotion differentiation between individuals, so too there are differences in emotion differentiation within individuals. In some situations, only one distinct negative emotion may be experienced, and in other situations a mixture of negative emotions may be experienced. To date, however, research on within-persons differences in emotion differentiation is

scarce. Therefore, the first aim of the present research was to explore which types of situation-specific configurations of negative emotions ("momentary negative emotion differentiation") occur in the daily life of young adults and to test whether these types of negative emotions configurations differ in appraisals of the emotion-eliciting event (controllability, familiarity, predictability, and personal relevance). The second aim was to test whether subgroups of individuals could be identified who differ in the probability with which they experience specific types of negative emotions configurations (high vs. low emotion differentiators). To model within- and between-persons differences in negative emotion differentiation simultaneously, a multilevel latent class analysis was applied to the data set of an ambulatory assessment study (N = 51 students, three occasions per day for seven days). At each occasion, participants reported whether they had experienced a negative event during the last four hours and, if so, rated their negative emotional experience (anger, sadness, shame, disappointment, and anxiety). In total, 552 negative events (and emotional experience during this event) were reported. The results showed that a model with four latent occasion-level classes and four latent person-level classes fit the data best. The occasion-level classes of negative emotional experience represented moments with a high probability of (a) all negative emotions, (b) anger, (c) anger plus disappointment, or (d) anxiety. One subgroup of individuals had a very high probability of reporting situations in which all negative emotions were experienced simultaneously and a low probability of reporting other types of situations (low emotion differentiation). In addition, two types of high emotion differentiation subgroups and an intermediate subgroup were identified. The occasion-level classes differed with respect to event appraisal patterns. The person-level classes differed with respect to the use of daily emotion regulation strategies (social sharing, rumination). The results demonstrate that multilevel latent class analysis can be a useful tool to analyze emotion differentiation as both "state" and "trait". Limitations and directions for future studies are discussed.

May the association between intrinsic motivation and deep processing be replicated in current self-regulated learning conditions? – A pilot study with electronic diaries

Loeffler, S. N.[1] ; Neumann, M.[1] ; Gidion, G.[2]

[1] *House of Competence, Karlsruhe Institute of Technology, Karlsruhe, Germany*
[2] *Institute of Vocational Education, Karlsruhe Institute of Technology, Karlsruhe, Germany*

INTRODUCTION It is common knowledge that intrinsic motivation is associated with deep processing. On the other hand deep processing should both facilitate long-term memory of the learning material and lead to higher success in comprehension-oriented exams. However, the existing evidence is based upon retrospective self-report data. If mental representations of past events are assessed rather than "online" experiences, subjects typically use a variety of heuristics to generate an answer. Thus, we explore the relationship between motivational state and comprehension-oriented strategies as well as the association with learning success directly in natural self-regulated learning conditions of university students. METHODS A sample of 25 students (f=11, m=14; 23.6 ± 1.7 years; 7.5 semester ± 2.4, ranging from 3 to 13) carried electronic diaries for 14 days. Whenever participants were studying for a prior determined task (e.g., written exam), they were requested to activate the electronic diary. Before the self-defined learning period, proposed learning time, learning goal and current motivational orientation (extrinsic and intrinsic motivation) was enquired. After termination of the defined learning period, actual learning time, subjective success, cognitive - as well as meta-cognitive learning strategies used during the current learning period, ability to

concentrate and effort was assessed. The items representing motivational state as well as cognitive- and meta-cognitive learning strategies were adopted from standardized questionnaires. Unfortunately, despite the registration term of two weeks, the number of measurement times averaged 6.9 (ranging from 2 to 23) per subject. Thus, for the statistical analyses only the mean value out of all learning periods per subject could be used. RESULTS Whereas subjective success was not associated with rehearsal ($r=.16$, $p>.05$), high correlations were found for all comprehension-oriented strategies, i.e. organisation ($r=.52$, $p<.01$), elaboration ($r=.58$, $p<.01$) and critical review ($r=.48$, $p<.05$) with learning success. Students, who indicated to be intrinsic motivated immediately before learning, used preferentially comprehension-oriented learning strategies, i.e. elaboration ($r=.50$, $p<.05$) and critical review ($r=.58$, $p<.01$), whereas intrinsic motivation was not associated with rehearsal ($r=-.13$, $p>.05$). However, for extrinsic motivation no significant correlation with the utilisation of specific learning strategies was shown. In addition high correlations arose between intrinsic motivation and both concentration ($r=.67$, $p<.01$) and effort ($r=.57$, $p<.01$). Extrinsic motivation was indeed correlated with effort ($r=.49$, $p<.05$), but not with concentration ($r=.30$, $p>.05$). DISCUSSION AND CONCLUSION The results revealed a strong association between current motivational state and preference for deep processing - shown solely for intrinsic motivation - also for university students in current self-regulated learning conditions. Unfortunately, the number of measurement times was too small in this pilot-study for modelling possible changes over time.

Individual differences in drug response: A time series analysis approach on the effects of tryptophan in quarrelsome individuals

Luckmann, A.L.[1] ; Bos, E.H.[2] ; Aan het Rot, M.[3]

[1]*School of Behavioural and Cognitive Neurosciences, University of Groningen, Groningen, Netherlands*
[2]*Department of Psychiatry, University Medical Center Groningen, University of Groningen, Groningen, The Netherlands*
[3]*Department of Psychology, University of Groningen, Groningen, The Netherlands*

INTRODUCTION: Individual differences in drug response are a widely known phenomenon in clinical psychopharmacology, yet in research this topic has largely been neglected so far. Time-series analysis can be used to investigate drug response at the individual level. We applied this method to data from a previous study in quarrelsome individuals suggesting that, at the group level, tryptophan supplementation decreases quarrelsome behaviors, increases agreeable behaviors, and improves mood during social interactions. METHODS: Participants were individuals selected for high trait quarrelsomeness who took tryptophan (3 grams/day) and a placebo daily for 15 days each and were instructed to record up to 10 social interactions per day. Record forms asked participants about their quarrelsome and agreeable behaviors and about their affective state during each interaction. Equidistant time points were generated by aggregating to mean levels of behavior and affect per morning, afternoon, and evening. Three men and three women were selected from the original group based on receiving tryptophan in the second half of the study and few missing data. The time of day and the day of the week were controlled for in the analyses. RESULTS: Univariate models showed that the effects of tryptophan on agreeableness, quarrelsomeness and mood varied among the selected individuals, with either no changes or changes in one, two, or all three of the variables studied. All observed changes were in the expected direction. CONCLUSION: Group-level effects of tryptophan may not necessarily translate to effects in individuals. To reveal the dynamic relationships between

changes in behavior and changes in mood, multivariate modeling will also be performed. Multivariate models may for example reveal mood improvement to be the result of decreased quarrelsomeness in one person and increased agreeableness in another person. In future clinical psychopharmacology studies, time-series analysis might help forecast drug response in individual patients.

A psychological analysis of the daily conversations of breast cancer patients and their partners

Mehl, M.R. ; Robbins, M.L. ; Weihs, K. ; Lopez, A.M.

University of Arizona, Tucson, Arizona, USA

Objective: This study examined the context and content of the natural, daily conversations of couples coping with breast cancer to understand with whom and about what couples talk while coping with breast cancer, and how their conversations relate to adjustment. Methods: Fifty-six women with breast cancer and their partners wore the Electronically Activated Recorder (EAR), an unobtrusive observation sampling method that periodically records snippets of ambient sounds, over one weekend to observe cancer conversations in their natural context. Couples also completed self-reported measures of psychological adjustment at baseline and at a two-month follow-up. Results: Cancer was a topic of approximately 5% of couples' conversations. Cancer conversations occurred most often within the couple (relative to friends and family), and were typically informational, rather than emotional, supportive, or practical. Though emotionally disclosing conversations occurred infrequently, they were the type of conversation most consistently related to psychological adjustment. Conclusion: This study was the first to estimate the frequency of cancer as a topic in the daily conversations of couples coping with breast cancer, and the contexts in which these conversations naturally occur.

Gene-environment interaction in daily life reward experience

Menne-Lothmann, C.[1] ; Viechtbauer, W.[1] ; Myin-Germeys, I.[1] ; Van Os, J.[2] ; Wichers, M.[1]

Department of Psychiatry and Psychology, South Limburg Mental Health Research and Teaching Network, EURON, Maastricht University, Maastricht, The Netherlands
[2] Department of Psychiatry and Psychology, School of Mental Health and Neuroscience, Maastricht University Medical Centre, The Netherlands. King's College, King's Health Partners, Department of Psychosis Studies Institute of Psychiatry, London, United Kingdom

Background: Previous studies have indicated that daily life positive affect can protect against future depressive symptoms and accelerate recovery after a depressive episode. One possible way to experience positive affect is in the context of small daily life positive situations. One previous study (1) has demonstrated that genetic variation in the COMT Val158Met gene influences the dynamic association between daily life positive events and the experience of positive affect. Aim: The current study aimed at investigating whether variations of genes involved in the human reward-system moderate the association between daily life positive events and positive affect in a large sample.

Method: Daily life positive events and positive affect was assessed in participants of various studies (N=858; nobs=27958) with use of the experience based sampling method (ESM). Furthermore, molecular genetic data were assessed about various genetic variations (n=25) known to play a role in the human reward-system (BDNF, COMT, DRD2, DRD4, OPRM1, SCL6A). Analyses were conducted over the whole sample but also within meaningful subsamples (healthy individuals, general population, psychotic patients, depressed patients, and first degree relatives of psychotic patients) to explore possible differential impact of genes in various diagnostic groups. Results: After correcting for multiple testing one variation within the BDNF gene moderated daily life reward experience in the whole sample (rs11030102) (ES1 = -.026, $p<.05$; ES2 = -.079, $p< .01$) but not in any of the subsamples. Conclusion: Resilience as assessed with daily life hedonic capacity appears only very weakly influenced by genetic variations within the reward-system. Previously reported genetic effects on reward experience could not be replicated. 1. Wichers M, Aguilera M, Kenis G, Krabbendam L, Myin-Germeys I, Jacobs N, et al. The catechol-O-methyl transferase Val158Met polymorphism and experience of reward in the flow of daily life. Neuropsychopharmacology. 2008 Dec;33(13):3030-6.

Long-term ambulatory monitoring of motor fluctuations in Parkinson's disease

Moore, S.T.

Neurology, Icahn School of Medicine at Mount Sinai, New York, USA

Background: Parkinson's disease (PD) is a neurodegenerative disorder that results from a progressive loss of dopaminergic neurons, predominantly within the substantia nigra. One of the disabling clinical manifestations of PD is locomotor dysfunction; shortened stride length, increased variability of stride, reduced walking speed, and freezing of gait (a transient block of movement, particularly when initiating gait, turning, or negotiating an obstacle). While dopamine replacement therapy is initially effective, most patients develop motor fluctuations after 3 years of treatment. 'On' states, in which the motor symptoms of PD are effectively treated, become shorter ('wearing off'), and periods of stiffness and difficulty of movement ('off' states) occur more frequently.Evaluation of long-term medication response in PD usually takes the form of a patient diary, where the Parkinsonian state is noted as 'on' or 'off', but these subjective records can be unreliable. The Unified Parkinson's Disease Rating Scale (UPDRS) is commonly used in research studies to intermittently assess PD symptoms. Despite widespread acceptance (70% of PD clinical trials utilized the UPDRS from 1994-1998) it is a relatively blunt instrument; analysis of gait is limited to assigning a single value between 0 (normal) and 4 (unable to walk, even with assistance) from brief clinical observation. Freezing of gait (FOG) is a debilitating symptom associated with an increased risk of falls and early nursing home placement. Clinical management of FOG is limited in large part by the difficult nature of assessing its severity, particularly in a community setting. Current approaches utilize subjective reports from patients or caregivers (either as a simple UPDRS rating scale [0-4] or FOG questionnaire), but our recent study of a cohort of PD patients with self-reported FOG symptoms demonstrated that scores from subjective FOG questionnaires did not correlate with actual freeze severity when walking (Shine et al. Parkinsonism Relat Disord 2012 18: 25-9). The de facto 'gold standard' of FOG assessment is clinical evaluation to determine number of FOG episodes, but inter-rater agreement is moderate at best (Morris et al. Parkinsonism Relat Disord 2012 18: 572-577). Motor function in PD patients can

fluctuate markedly over the course of a day, and an objective long-term measure of gait may provide more effective titration of dopaminergic medication, better comparative treatment evaluations, and, in the case of freezing of gait, the potential for real-time intervention. Here we summarize a number of studies conducted by our laboratory on ambulatory monitoring in PD patients. Long-term monitoring of stride length: The length of an individual's stride is a prominent indicator of Parkinsonian state, such as the small shuffling steps in the unmedicated condition. Stride length was calculated using shank-mounted inertial measurement units; swing extent was determined from angular velocity, and a calibration algorithm corrected for the forward motion of the body over the stance foot (Moore et al. Gait Posture 2007 26:200-7). Simultaneous video and ambulatory monitoring of PD patients (in a sleep laboratory) demonstrated that accuracy and reliability of stride length measures were maintained over 24-h (Moore et al. BioMed Eng Online 2011 10:82).Dynamic locomotor response to levodopa: The locomotor response to the first levodopa administration of the day was assessed in PD patients using a shank-mounted sensor array. Patients walked up to 100m every 10-15 min over a 90 min period. Stride length was fit with a Hill function. Stride transition from the 'off' to 'on' state ranged from a smooth hyperbolic curve to an abrupt step-like response, and the sharpness of this transition was correlated with disease duration (consistent with finger-tapping studies), and may reflect reduced buffering capacity of pre-synaptic nigrostriatal dopaminergic neurons as the disease progresses. Latency (time until stride length increased 15% of the difference between baseline and maximum response) was inversely correlated with age at onset of PD; motor fluctuations are more common and commence sooner after initiation of levodopa therapy in younger onset PD (<40 years) (Moore et al. Exp Brain Res 2008; 184; 469-78). Freezing of gait: The FOG detection algorithm is predicated on the assumption that freezing of gait entails an increase in high frequency leg movement ('trembling') in the relative absence of locomotor activity. The ratio of shank vertical acceleration power in the 'freeze' (3-8Hz) and 'locomotor' (<3Hz) bands detected FOG with an accuracy of 90% (Moore et al. J Neurosci Meth 2008 167: 340-8), and was strongly correlated with clinical assessment from 10 PD experts (Morris et al. Parkinsonism Relat Disord 2012 18: 572-577). Potential applications of ambulatory FOG monitoring include community assessment and sensory prompts to facilitate resumption of locomotion. Support NIH-1R41NS59086-1A1; NASA-NNX09AL14G; NSBRI-NCC9-58.

Longitudinal electrodermal recordings of mentally disabled individuals and their caretakers

Noordzij, M.L.[1]; Laroy-Noordzij, M.E.[2]

[1] *Department of Cognitive Psychology and Ergonomics, University of Twente, Enschede, The Netherlands*
[2] *De Twentse Zorgcentra, Enschede, The Netherlands*

Background Almost no scientific observations exist concerning the physiological changes and events that arise before and during human aggressive behavior. Yet, there are many instances where it might be of great benefit to have insight in these changes, for example when an individual has limited communicative capabilities to express their emotions and rising frustrations. In our project we focused on such a situation by measuring physiological changes of people with severe mental disabilities, who also consistently showed challenging behavior (CB) such as aggressive acts and self-injurious behavior. Caretakers often report being surprised by these outbursts and explicitly express a need for additional tools to gain insight in the arousal levels of their clients. The aim of our project was to investigate the potential value of ambulatory physiological measurements in bringing this insight to the caretakers. An additional

goal was to also examine the relation between the physiological changes of the caretakers themselves and the CB of the clients. We did this because actions of direct care staff have been found to be antecedents of the aggressive behavior of clients, and therefore we wanted to investigate the possibility that heightened levels of arousal in caretakers might be associated with a higher likelihood of future aggressive behavior. Method We followed 9 individuals with severe mental disabilities and their regular caretakers during sessions of two to three hours on a fixed timeslot and day of the week over a period of months. During all those sessions (typically a total of 24 per client-caretaker couple), we measured electrodermal activity (EDA) with a wrist sensor, and we recorded the clients behavior on video. EDA, and the parameters that can be extracted from it, such as the number of skin conductance responses per minute, have been found to be a good estimate of the activity of the sympathetic part of the autonomic nervous systems. As such, it can be taken as a further operationalization of the arousal level of the client and caretaker, which was the dependent variable of interest for our project. The measurement device was the Q sensor "Curve" from Affectiva, which allows for wireless, non-intrusive measurements of EDA with a sample rate of 32Hz (which is more than sufficient for state of the art analysis methods). A protocol was developed to realize these measurements, while minimizing distress for the clients (see Noordzij, Scholten, Laroy-Noordzij, 2012, Measuring Behavior). After each session caretakers noted whether any CB had occurred. Subsequently, trained professionals examined the videos and determined the nature, severity and onset of the CB. EDA parameters were extracted automatically both with computationally simple trough-to-peak analyses, and with more sophisticated decomposition analyses of the signal into its phasic and tonic components. Results and Discussion As expected the participants displayed CB during many of the sessions. These events were typically associated with medium to highest amplitudes and frequencies of the electrodermal responses. Our data analysis also brought to light some of the complexities surrounding the determination of arousal levels of these clients. Even detailed viewing of the videos by trained professionals resulted in only moderate levels of inter-rater reliability concerning the severity CB and especially the precise onset of CB. This reflects the observation of experienced caretakers that the buildup phase towards CB is hard to detect. On the other hand, we also found low correlation between EDA fluctuations of caretakers and clients. This, and further video analysis, showed that caretakers did not continuously interact and track the arousal level of the clients on a behavioral level. This fact alone opens up a set of possibilities to create a monitoring system based on the EDA levels of client, which informs the caretaker when EDA levels are in a medium to high range (i.e. the only moments when CB occur). Currently, we are developing such a monitoring prototype, which, together with findings from our ongoing analysis of this rich data set will be further discussed during the presentation.

Bipolar affective disorder and older adults (BADAS) study

O'Rourke, N.

Simon Fraser University, Burnaby, Canada

It is estimated that there are today 75,000 Canadians 50+ years of age with bipolar disorder (BD); moreover, the number of older Canadians with BD will triple over the next 10 years. Despite these growing numbers, psychosocial research focussing on older adults with BD is virtually nonexistent. This 4-year study will include intensive periods of data collection; these 2-week periods will each separated by 8-months. Participants will be prompted at 2-times per day (12 hour window) to report current mood, medication adherence and recent life events. We intend to use of a

GPS located electronically connected to an iPad or similar tablet-type device. The GPS information (recorded every 20 seconds) will allow us to determine if periods of mania are heralded by expanding geographic range, rapid movement between points or, novelty seeking; conversely, contraction of movements may be a precursor to major depression episodes. Two-hundred and five participants will be recruited with a 10+ year BD diagnosis; medical information will be obtained during regular psychiatric assessments. We will use a range of contemporary research methods with emphasis on BD in later life (e.g., retirement, bereavement, concurrent physical illness).

Ambulatory impedance cardiography in heart failure: A validation study

Parry, M.R.N. [1] ; McFetridge-Durdle, R.N.[2] ; Simpson, C[3] ; McDonald, M.[4] ; Haley, D.[5] ; Heather, A.[6] ; Day, A.[7]

[1]Bloomberg Faculty of Nursing, University of Toronto, Toronto, Canada. Nurse Practitioner, Cardiac Surgery, Kingston General Hospital, Kingston, Canada
[2]School of Nursing, Memorial University of New Foundland, St Johns's, New Foundland, Canada
3Cardiac Program, Kingston General Hospital, Kingston, Canada. Department of Cardiology, Queen's University, Kingston, Canada
[4]University Health Network and Mount Sinai Hospitals, Toronto, Canada
[5]Department of Psychology, University of Toronto Scarborough, Toronto, Canada
[6] School of Nursing, McMaster University, Hamilton, Canada
[7]Clinical Research Centre, Kingston General Hospital, Kingston, Canada

Background. Heart failure (HF) is a heart condition with a high medial, social and economic impact. According to estimates from the European Heart Failure Association, 26 million individuals have HF worldwide, 3.6 million individuals are newly diagnosed with HF every year in Europe, and 50% of individuals with HF will die after 4 years. The incidence of HF is projected to increase, with estimates suggesting a three-fold increase in HF hospitalizations over the next ten years. Projections indicate that by 2030, the total cost of HF will increase almost 120% to $70 billion from the 2013-estimated total cost of $32 billion in the United States (US). Over 50% of individuals with HF in Canada are managed in the community by family physicians, and in 2010 in the US; there were 1.801 million physician office visits with a primary diagnosis of HF. The economic cost of HF is estimated in billions of dollars per year, with the need for repeated hospitalization being the most significant contributing factor the direct costs associated with the disease. Pulmonary congestion/decompensation has been the cardinal cause of HF hospitalization. HF decompensation occurs rapidly, with symptoms typically occurring 3-5 days before hospitalization. Correct clinical diagnosis of HF in the emergency room occurs <80% of the time. Accurate and early diagnosis of decompensation is necessary to reduce morbidity and mortality. A variety of methods (weight, natriuretic peptides, chest radiographs) have been used to detect symptoms of decompensation with inconclusive results. Impedance assessment may prove to be an earlier and more accurate marker of decompensation than the typical standard assessment strategies. There is preliminary evidence to suggest the implanted OptiVol® impedance system accurately measured fluid overload and predicted decompensation in a small sample of individuals with HF. However, to adequately assess individuals with HF in community settings, a non-invasive measurement of fluid overload must be investigated. Aim. The primary aim of this study was to assess the validity of a non-invasive impedance system (VU-AMS version 5fs) to the invasive Optivol® impedance system, in measuring intrathoracic impedance in individuals with chronic HF. The secondary aim of this study was to evaluate the sensitivity of the VU-AMS version 5fsto detect hemodynamic changes

associated with postural shift in individuals with HF. Methods. Twenty-eight men and women with HF were recruited from an outpatient device clinic at a tertiary care hospital in Southeastern Ontario, Canada. They were greater than 30 days post-implantation of either an internal cardiac defibrillator (ICD) or a cardiac resynchronization therapy (CRT) device. Participants completed a sit-to-stand posture protocol wearing the VU-AMS version 5fs ambulatory monitoring system and a Spacelabs Ambulatory Blood Pressure (ABP) system (Spacelabs, Model 90207, Spacelabs Inc., Washington, US). Orthostatic challenge (sitting to standing) was used to stimulate hemodynamic changes in the HF participants. This procedure was repeated and measures recorded using the Optivol® impedance system and the Spacelabs ABP system. Results. For all study participants, near simultaneous impedance and hemodynamic profiles from the Optivol® and VU-AMS version 5fs systems were collected in both sitting and standing postures. Due to the differing characteristics of the devices such as placement of the electrodes, the two devices do not provide comparable impedance values. We sought to determine if the values of the implanted Optivol® impedance values could be accurately predicted by the non-invasive VU-AMS version 5fs impedance values. During this presentation we will discuss the hemodynamic and impedance profiles of the participants. We will discuss our ability to identify an accurate equation to transform the values of one device to the other device. We expect there to be a quadratic relationship between the values of the two devices and will use linear regression to fit the following model: OptiVol® = ß0 + ß1 (VU-AMS)1/2 + ß2 (VU-AMS) + ß3 (VU-AMS)2 + e Conclusions. This transformation of values would suggest the devices provide equivalent information, and thus could be used interchangeably in caring for individuals with chronic HF. This has important implications in that non-invasive impedance assessment may provide early warning of impending decompensation and necessary diagnostic information for the more accurate titration of medication in individuals with HF in both urban and rural settings. Non-invasive impedance cardiography may accurately, safely, and inexpensively provide early and accurate measures of decompensation and prevent emergency room visits and hospitalizations.

EMA goes to jail: feasibility, reliability, and insights into the daily experience of incarcerated juvenile offenders

Pihet, S.[1] ; Suter, M.[2] ; De Ridder, J.[2]

[1] *Department of Psychology, University of Fribourg, Fribourg, Switzerland*
[2] *Child and Adolescent Psychiatric Unit, University of Lausanne, Lausanne, Switzerland*

Introduction: EMA has brought several insights regarding the daily experience of people living with mental disorders. However, this method has never been used in incarcerated juvenile offenders, despite its potential to shed a new light on the situational triggers of institutional misconduct or violence, and in particular on the role of impulsivity in this phenomenon. Impulsivity is known to be a strong predictor of the frequency of disruptive behaviors (DB) inside or outside of forensic institutions. Yet most of this evidence is based on retrospective questionnaire measures or experimental testing, leaving a knowledge vacuum as to how impulsivity may interact with natural situational triggers to produce DB in incarcerated juvenile offenders, and particularly in those with elevated callous-unemotional (CU) traits, which typically display more frequent and severe misconduct. This study thus aims at examining the DB exhibited by incarcerated juvenile offenders in their natural setting, and their momentary associations with impulsivity, emotional state and relational climate. It further aims at investigating how CU traits moderate these associations. Methods: 48 juvenile offenders incarcerated in two forensic facilities (71% males, 77% with CD, mean

age 15.4), and 51 high-risk adolescents residing in two boarding schools for disruptive children (84% boys, 39% with CD, mean age 14.2), answered 4x/day during 8 days questions on a PDA regarding their DB, impulsivity, negative emotions, and conflicts with peers and staff. All answers were given on bipolar scales from 0 to 100. For accuracy checks, staff member also reported on participants' DB and impulsivity using identical questions (paper-pencil). CU traits were assessed with the Inventory for Callous-Unemotional traits. The presence of conduct disorder (CD) was established using a standardized diagnostic interview. We conducted two-level (L1: measurement occasions, L2: participants) multilevel analyses, predicting momentary DB from momentary impulsivity, negative emotions, and conflicts on L1. We tested the moderating effects of CD and CU traits by entering them as predictors on L2. Results: Participation rates were very high (96%). However, as expected with such an intensive procedure in this difficult population, some adolescents dropped out (18%) or provided invalid data (5%). Interestingly, completers and non-completers did not differ on any sociodemographic variables. On average, the adolescents reported moderate levels of DB (B=24.8), with 52% of the variance on L2 (between participants) and 48% on L1 (within participants). While gender had no significant effect on DB (B=0.56, p=.878), adolescents recruited in forensic facilities reported significantly less DB (B=-14.75, p<.001), and adolescents with CD (B=9.27, p=.003) or CU traits (B=16.67, p<.001) significantly more. We thus controlled for recruitment place in subsequent analyses. Momentary DB were significantly higher when adolescents reported more impulsivity (B=0.20, p<.001), negative emotions (B=0.14, p<.001), and conflicts with peers and staff (B=0.20, p<.001). These associations were not moderated by the recruitment place nor by CD or CU traits, suggesting that all adolescents are at risk of misconduct when feeling bad, "on edge" and experiencing relational tensions. Additional analyses regarding the relational climate revealed that momentary DB were higher in times of conflicts with peers (B=0.08, p=.016) and staff (B=0.14, p<.001), and lower in times of pleasant interactions with peers (B=-0.07, p=.003) and staff (B=-0.07, p=.020). One moderating effect was found: only adolescents with CD evidenced decreased momentary DB when having pleasant interactions with staff members (B=-0.11, p=.035). Additional analyses regarding emotions revealed that momentary DB were higher when adolescents reported feeling angry (B=0.14, p<.001), nervous (B=0.14, p<.001) and guilty (B=0.14, p<.001). Three moderating effect were found: adolescents with CU traits evidenced less DB than others when nervous (B=-0.08, p=.043), and substantially more when frustrated (B=0.13, p=.021), while those with CD evidenced less DB when frustrated (B=-0.13, p=.013). Conclusion: Momentary impulsivity, negative emotions and interpersonal conflicts all independently contribute to putting adolescents at risk for misbehaving during their residential stay. Adolescents with CD seem to react in particularly positive manner to pleasant interactions with staff members, while youths with high CU traits react in a particularly negative one to frustration. This new evidence points to the importance of tailoring prevention strategies for institutional misconduct and interventions for this high-risk population.

Emerging technologies for measuring sleep in natural environments

Raymann, R.

Philips Group Innovation – Research, Eindhoven, The Netherlands

Numerous studies have linked sleep to mood, occupational performance, wellbeing, quality of life, and health. Currently, the gold standard measure of sleep is PolySomnoGraphy (PSG) that involves many electrodes attached to the body and head. PSG, while widely used, is obtrusive and can disturb the very sleep routines it intends to measure. As such, it is more suited for clinical research where short-term sleep diagnostics are the main target. It is less suited, however, for ecologically valid studies of sleep in daily life. This presentation will highlight and critically review the validity of new technologies aimed at measuring sleep using subjective, bio-mechanical, and non-invasive physiological methods in natural environments.

Ambulatory assessment of physiological reactivity to infant crying in maltreating and non-maltreating mothers

Reijman, S. ; Compier-de Block. H.C.G.; Alink, L.R.A. ; Bakermans-Kranenburg, M.J. ; Van IJzendoorn, M.H.

Child and Family Studies, Leiden University, Leiden, The Netherlands

The relationship between child maltreatment and physiological reactivity to infant crying was evaluated in a sample of 45 maltreating and 45 non-maltreating mothers. All mothers were recruited at a mental health facility, where maltreating mothers received family therapy. Their Child Protection Services (CPS) records were coded with the Maltreatment Classification System (MCS; Barnett et al., 1993) to substantiate abuse and neglect, both physical and emotional. Non-maltreating mothers came from a clinical subdivision of the same mental health facility dealing with children's learning or developmental problems. In this group a Dutch adaptation of the Maternal Maltreatment Classification Interview (MMCI; Cicchetti, Toth & Manly, 2003) was used to verify the absence of maltreatment. During a standardized cry paradigm, mothers listened to nine cry sounds of three different pitches (see Out et al., 2010). Cry sounds were derived from the spontaneous crying of a healthy 2-day old, full birth-weight, full-term female infant, midway between scheduled feedings. A 10-s portion of the sustained period of crying, containing seven expiratory sounds (with peak fundamental frequencies of ± 500 Hz) was selected for presentation. Two new 10-s cry stimuli were created by digitally increasing the original cry to approximately 700 Hz and 900 Hz. The 500 Hz cry is characteristic of the cries of normal, healthy infants (LaGasse et al., 2005); fundamental frequencies of 700 and 900 Hz (and even higher) are observed in transient pain cries of healthy infants (Porter et al., 1988; Zeskind & Collins, 1987) and also in the cries of infants with medical and neurological conditions (Soltis, 2004). Each fundamental frequency was presented three times, over three blocks, preceded by a baseline episode and concluded with a recovery segment. Heart rate, vagal tone (RMSSD), and skin conductance were measured during the whole task using an ambulatory monitoring system (VU-AMS5fs; TD-FPP, Vrije Universiteit, Amsterdam, the Netherlands). E-prime had been programmed so that markers were sent to the ECG recording during baseline, the presentation of each cry sound, the answering of the questions, and recovery. HR, RMSSD, and SCL were averaged per block. Repeated measures analyses of variance indicated that maltreating mothers showed lower heart rate reactivity to the cry sounds than non-maltreating mothers. No effects were found for vagal tone. Maltreating mothers also showed a

smaller increase in SCL from baseline to the cry sounds than non-maltreating mothers. The lack of functional arousal in maltreating mothers to infant stimuli may partly explain an impaired capacity to respond adequately to their children.

MoodBuster: Smart depression screening, monitoring and treatment

Riper, H.[1] ; Warmerdam, L.[1] ; Klein, M.[1] ; Smit, J.[2] ; Cuijpers, P.[1]

[1] *Department of Clinical Psychology, VU University Amsterdam, Amsterdam, The Netherlands*
[2] *GGZinGeest, Department of Psychiatry, VU University Medical Center,Amsterdam, The Netherlands*

Depression is expected to be the disorder with the highest disease burden in high-income countries by the year 2030. In this presentation we will present the results of the ICT4Depression (ICT4D) project. ICT4D is a European FP7 project, which aims to contribute to alleviate the depression burden by making smart use of ICT innovations. The widespread use of mobile ICT devices enables ambulatory monitoring without the need for elaborate or tedious sensor systems. Physical sensing (e.g. activity monitoring), environmental sensing (e.g. location or social context) and mood assessments offer a wealth of opportunities to follow a patient's disease or treatment progress. In turn these may result in better depression prevention and treatment strategies. In the ICT4D project psychologists, system architect engineers, bio-sensor developers, mobile phone software developers and machine learning experts collaborated with the aim to develop an integrated intelligent system for the treatment of depression ("MoodBuster") and to tests it's feasibility, acceptability and impact on depressed persons. MoodBuster is a multicomponent unguided self-help system to treat depression in primary care. MoodBuster consists of six flexible and tailor-made self-help treatments for depression based on cognitive behavioural therapy (CBT) and related treatments such as problem solving therapy. Patients can follow these treatments by making use of a smartphone and a PC. The smartphone is also used for the real-time mobile monitoring of the patient's mood, cognitions and behaviour in their natural environment. Monitoring of mood and activities is an important (CBT) depression treatment component. Ecological momentary assessment' (EMA) provides insight into the dynamic processes and ecological factors that cause and may treat depression. Smart phones significantly extend EMA methods as they enable (-) monitoring in real time as opposed to retrospective-recall strategies that may be influenced by memory bias and (-) the monitoring of other variables assessed through incorporated sensors such as GPS, motion detectors and sounds recordings. These in turn may enrich and enhance the validity of traditional EMA self-reports only (such as pen and paper diaries). MoodBuster makes also use of wearable biomedical sensor devices for monitoring activities and electrophysiological indicators ((e.g. cardiovascular and sympathetic nervous system indicators) and a wireless pill box that supports and measures medication adherence to anti-depressant medication. In this project we have also explored whether techniques from artificial intelligence and computer science may add intelligence to web-based interventions for mental disorders by means of dynamic computerized modelling. Underlying the individual technological monitoring devices is an overall computational predictive model (reasoning system) that monitors the individual state and progress of a depressed patient, which are automatically communicated to both the patient and his GP. These models may predict how individual depression trajectories evolve and how therapeutic interventions affect specific patients. Thereby clusters of patients may be identified for whom Internet-based treatment or standard care is most effective. The use of ecological momentary assessment (EMA) and intervention methods (EMI)

may strongly improve the potentials of these reasoning systems and may be used for the screening, monitoring and intervening with depression. In this presentation we will present the results of two pilot studies that assessed the feasibility, acceptability and impact of MoodBuster on depressed patients. Two pilot studies have been prepared, one in Sweden (finished) and one in the Netherlands (currently running). In total 50 patients with a DSM-IV depression diagnosis have been included in the two pilots. Results will be presented on a national level as well as on a combined Dutch and Swedish level. Given the pilot nature of these studies and the research being at an early stage, we will also present lessons learned from the perspective of patients and researchers concerning the EMA methods we have applied. We will end this presentation with a discussion on whether and how these innovations and new study methods may enrich existing eMental-health interventions.

The influence of weather on symptoms and mood in people with hay fever

Rostalski, T.R. ; Muehlan, H.M. ; Schmidt,S.S.

Department Health and Prevention, Institute of Psychology, University of Greifswald, Greifswald, Germany

Aims. Weather is believed to have an impact on behavior, cognitions and affective experience. It can be assumed that this effect is increased in subjects with a weather-related disease, such as hay fever. But until now there is no research. Therefore, this study examines the relationship between different weather parameters and mood and symptoms of hay fever in daily life. Method. Twenty-four people with hay fever filled out customized electronic diaries over a course of two weeks during grass pollen season. They were asked three times a day to answer questions on their symptoms (nose, eyes) and mood (valence, calmness, tiredness). Weather data (temperature, relative humidity, air pressure, wind power, sunshine duration, precipitation) were obtained from the German Weather Institute. Results. Multilevel modeling analyses revealed a relation between temperature and nose symptoms, eye symptoms and valence. Also relative humidity was related to nose symptoms. There were no relations between the weather parameters and calmness or tiredness. Discussion and Conclusion. Consistent with former findings this study revealed a relative small impact of weather on mood. In contrast to previous research with healthy person there was no relation between weather and the two valence dimensions of mood, tiredness and calmness. This can be attributed to some characteristics of the disease.

Interpersonal and intrapersonal concomitants of the blush in daily life: An event-contingent recording study

Aan het Rot, M.; De Jong, P.J.

Department of Psychology, University of Groningen, Groningen, The Netherlands

Blushing may usually be undesirable but occasionally have a remedial function. This idea has been proposed by several researchers interested in the adaptive value of the blush. It has been tested in laboratory settings, but never in daily life. In the present study we employed for the first time an event-contingent recording method for assessing how healthy young adults (N = 64) feel, behave, and perceive others when blushing during their every-day social interactions. About 1 in 15 recorded interactions involved blushing, though this number varied considerably across

participants. Consistent with previous retrospective studies, blushing occurred relatively frequently during interactions with high-status others, romantic partners, and groups. Blushing was associated with feelings of embarrassment, shame, exposure, self-consciousness, and anxiety. This may help explain why people often consider blushing as a highly undesirable response. In apparent conflict with the notion that blushing has an appeasement function, participants did not report high levels of submissive and agreeable behaviors when they blushed compared to when they did not blush, nor did they perceive others differently. Yet frequent blushers generally reported lower levels of dominant behavior and perceived their interaction partners as more dominant. These findings support the idea that blushing is often unpleasant and can be maladaptive. Further, in infrequent blushers, blushing was associated with higher levels of positive affect. This supports the view that blushing might sometimes also have desirable effects.

A mobile subliminal priming intervention for pain

Rutchick, A.M.[1] ; Valdez, A.M. [1]; Flynn, C.B.[2]

[1] *Department of Psychology, California State University, Northridge, USA*
[2] *Seattle,USA*

Pain is challenging to treat and contributes to increased health care costs and lower quality of life. Thus, there is utility in developing new approaches to pain management. This study applied principles derived from guided imagery protocols, namely the envisioning of pleasant and relaxing experiences, to a priming-based intervention. Specifically, subliminally exposing participants to relaxing images could activate corresponding physiological and affective states and thereby confer resistance to pain. Pilot research demonstrated that this procedure can be effective by presenting images on a desktop computer; the current study used a mobile device to administer the intervention. Healthy undergraduates (N = 100) completed a baseline cold pressor task while continuously indicating how much pain they felt using the Faces Pain Scale (intensity was recorded every five seconds). Participants withdrew their hands from the ice bath when the discomfort became too great; immersion time served as a measure of pain tolerance. Next, participants used a mobile device (an iPod Touch) to complete a categorization task that they were told could potentially decrease their discomfort in the cold pressor. Unbeknownst to participants, they were subliminally (20ms) exposed to either relaxing images (e.g., Zen gardens, beach scenes) or neutral images (abstract paintings) while completing the categorization task. The participants then completed a second cold pressor task, again while indicating pain intensity. Participants exposed to relaxing images tolerated the cold pressor for significantly longer, relative to baseline (mean difference = 3.9 sec), than did participants exposed to neutral images (mean difference = -6.5 sec, t = 2.31, p = .02). Nineteen of the 49 (39%) participants who received the relaxing images felt meaningfully less pain (a difference of at least 1.3 scale points per time point) during the second cold pressor task, compared to 8 out of 51 (16%) participants who received the neutral images; this difference was statistically significant (OR = 3.40, ?2= 6.76, p = .01). Future investigations will test this intervention on participants with clinical pain conditions.

Instability of self-esteem and affect in patients with Borderline Personality Disorder – findings and methodological considerations

Santangelo, P.S.; Koudela-Hamila, S.K.H.; Ebner-Priemer, U.W.

House of Competence, Karlsruhe Institute of Technology, Karlsruhe, Germany

Objectives: Affective instability and unstable self-image are essential criteria for a diagnosis of Borderline Personality Disorder (BPD). Even though the advent of ambulatory assessment methodologies facilitated the assessment of symptoms over time and therefore advanced analyzing instability, it seems that only the investigation on affective instability has benefited from this development; to date, there are no studies examining the criterion of unstable self-image in patients with BPD. We used e-diaries to examine affective instability and instability of self-image in every day life in patients with BPD. Methods: 66 female BPD patients and 75 female healthy control participants carried e-diaries over four consecutive days for 12 hours each. The e-dairies prompted participants approximately every 60 minutes (± 10 minutes) to rate their current affective state, state of distress, and momentary self-esteem. We began our data analyses by graphing the data by color-coding the intensity of each e-diary rating of each participant. This offers the possibility of visualizing the full 3-dimensional data set covering subject, time and intensity. To analyze instability of affect and self-esteem, we used three state-of-the-art instability indices, namely a multi-level model for squared successive differences (a gamma model with a log link), a multi-level model for probability of acute changes (a logistic model with a logit link), and aggregated point-by-point changes. Results: Graphing the data revealed obvious differences among the BPD patients and HCs: both a level effect with BPD patients showing lower self-esteem, higher distress and more negative affect as well as obviously elevated instability with regard to self-esteem, distress and affect in the BPD patients. The statistical analyses clearly confirmed our first impression, revealing that, in accordance with our hypotheses, patients with BPD showed a persistent pattern of heightened instability compared to HCs. The heightened instability among patients with BPD was found in self-esteem as well as distress and affect and with regard to all three state-of-the-art instability indices. Thus, these findings are consistent across statistical indices for both self-esteem and affect. Conclusions: Even though earlier studies indicated an altered affective instability in BPD, this is the first study which applies three state-of-the-art instability indices on the same data set. Moreover, it is the first study to investigate unstable self-esteem in patients with BPD. We discuss methodological considerations relevant to these findings, namely the problems one has to face when investigating unstable symptoms such as choosing an adequate time-sampling strategy that fits the underlying process, taking into account the temporal order of data (i.e., distinguishing between instability and variability), as well as considering the mathematical dependency of instability and intensity (i.e., floor and ceiling effects).

Physiological responses to infant crying in adult adoptees: the Leiden Longitudinal Adoption Study

Schoenmaker,C. ; Huffmeijer, R. ; Van der Voort,A. ; Linting, M. ; Van IJzendoorn, M.H. ; Bakermans-Kranenburg, M.J. ; Juffer, F.

Centre for Child and Family Studies, Leiden University, Leiden, The Netherlands

In the Leiden Longitudinal Adoption Study, we followed 190 internationally adopted children from infancy to young adulthood. These children arrived in the Netherlands before the age of six months and were adopted from Sri Lanka, South Korea, and Colombia. Multiple assessments were conducted in the first year after arrival, and in later follow-ups at 7, 14, and 23 years, we investigated four major domains of development: social development, personality development, cognitive development, and behavioral adjustment. At the most recent assessment in young adulthood (mean age 23 years) we collected data regarding the adoptees' representations of attachment, parental support, behavior problems, and temperamental characteristics, as well as their physiological responses to salient (social) stimuli. Because the adoptees are at an age where the formation of a family and transition to parenthood becomes an important issue, a main interest is their response to infant signals. Crying is perhaps the most salient infant signal, aimed at eliciting caregivers' attention and parenting responses. Importantly, individual variation in parents' physiological responses to infant crying has been related to differences in the quality of their parenting. Previous results have suggested that a moderate degree of reactivity, including the efficient inhibition of parasympathetic activity, may promote adequate parental responding whereas a sympathetic overreactivity may be characteristic of less adequate or harsh parents. Participants' electrocardiogram, thoracic impedance, and skin conductance were monitored while they listened to infant cries varying in pitch (higher pitched cries are usually perceived as more urgent). Using the current paradigm, relations between the adoptees' personal and social characteristics and their parasympathetic (respiratory sinus arrhythmia; RSA) as well sympathetic (skin conductance and pre-ejection period; PEP) responses can be examined.

The cardiovascular load of repressive coping: Is there any?

Schwerdtfeger, A.[1] ; Rathner, E.M.[2]

[1]*Department of Psychology, University of Graz, Graz, Austria*
[2] *University of Vienna, Vienna, Austria*

Objective: Repressive coping (i.e., low vigilance, high cognitive avoidance) has been associated with elevated cardiovascular reactivity and diminished self-reported negative affect (so-called subjective-autonomic response dissociation; SARD) in response to stressful encounters. However, there is a lack of knowledge regarding the ecological validity of this response pattern and the relationship between cardiovascular diseases and repressive coping. Methods: The study aimed to analyze associations between SARD and repressive coping throughout a day in 120 individuals using ambulatory monitoring technology. Heart rate was recorded via ECG and subjective reports of negative affect as well as the experience of demand and control (as indicators of stress) and situational characteristics were assessed several times a day via mobile electronic devices. Moreover, the intima media thickness (IMT) as a surrogate marker of preclinical atherosclerosis was measured by means of high-resolution duplex sonography.

Results: Repressive coping relative to other coping dispositions was accompanied by elevated SARD during stressful episodes in daily life, thus supporting previous laboratory research. IMT was unrelated with repressive coping. However, participants showing both vigilant and avoidant coping strategies (so-called high-anxious copers) exhibited higher IMT as compared to other individuals. Conclusions: The findings throw doubts on the hypothesis that repressive coping negatively impacts cardiovascular health.

Using social gaming environment to promote healthy eating and exercising

Shiyko, M.[1] ; Seif El-Nasr, M.[2] ; Sceppa, C.[3] ; Durga, S.[2] ; Naab, P.[1]

[1]*Department of Applied Psychology, Northeastern University, Boston, USA*
[2]*Game Design, Northeastern University, Boston, USA*
[3]*Department of Health Sciences, Northeastern University, Boston, USA*

Currently, about 34.4% of the U.S. adults above 20 years old are overweight, and, with the estimated rate of growth, it is projected that 86% of the adult population will be either at risk for obesity or obese by 2030 (Harris, Perreira, & Lee, 2009). Similar trends are also observed in other developed nations. Major contributing factors to the epidemic are a sedentary lifestyle and poor diet. For the younger generations, involvement in media (e.g., internet, computer games) takes up a substantial part of daily life. While this media involvement is a potential contributing factor to a sedentary lifestyle, it is also a unique opportunity for intervention and prevention. In collaboration with a gaming company, we have been developing and evaluating a social game environment called My Spa Resort™ (IgnitePlay, 2011), which is aimed to promote changes in eating and exercise behaviors through daily interactions with the game. The goal of this presentation is three-fold: (1) to describe the gaming environment and its technological features that gather rich behavioral data in real or near-real time; (2) to report on acceptability of the game and game adherence in a sample of 18 participants from a pilot study; (3) to provide initial evidence of the game's efficacy. This is one of few studies that undertake a formal evaluation of a commercial social game for health behavior change. Beyond marketing studies, game environments received very scarce attention in terms of empirical studies that examine their potential for health behavior change. Without such empirical evidence, games' effectiveness and their influence on health-related habits are difficult to establish (exceptions include Chittaro & Sioni, 2012; Dawes, et.al, 2011; Williams, 2008). (1) My Spa Resort™ is an online social game built on theoretical principles of Self-Determination and Social Cognitive theories. Players build and run a virtual "health Spa resort," and its growth and success is tied to health-based activities that players undertake in real life. Examples of activities include choosing a healthy snack, including vegetables in a diet, climbing stairs, and walking. Further, an online community of fellow players creates opportunities for vicarious learning, motivation, and mutual support. Daily activity logs track a variety of health-related behaviors that, beyond the game engagement, track eating and physical activity behaviors, such as walking to work everyday or eating fruits or vegetables. In our presentation, we will demonstrate major features of the game and emphasize the potential of daily data collection in an enjoyable and engaging gaming environment. (2) We will report on findings from an ongoing longitudinal pilot study examining validity, acceptability, and impact of the game in a sample of 18 undergraduate students. Based on the baseline measures, 33.3% of the sample are female, 42.5% report not exercising, and 33.3% report exercising once or twice a week. In addition, 52.4% of the sample plays video games daily, and 28.6% 3 to 4 times a week. We will report on acceptability of and adherence to game playing.

Acceptability is being evaluated through qualitative weekly semi-structured interviews over the course of one month. Themes include integration of the game into participants' lives, assessment of the game's usefulness, engagement, and accessibility, and barriers to daily engagement. Adherence is evaluated with daily time spent playing, the number of missed play days, and longitudinal patterns of game playing. (3) Finally, game effectiveness is evaluated by comparing baseline and end-of-the-study (one month follow-up) self-report measures of intensity and frequency of physical activity, and consumption of vegetables and fruits. Given the small sample, we also report on the participants' qualitative assessments of any health-related changes they have adopted in their lives over the course of one month while playing the game. While there has been some work on games and health, little evidence exist about feasibility of using games for collecting health-related data longitudinally and eliciting and motivating behavior changes. This is one of the first studies that undertake a formal evaluation of the game for health-behavior change that targets young or middle-aged adults interested in playing social games.

Varying-coefficients regression model for analysis of intensive longitudinal data

Shiyko, M.[1]; Dziak, J.[2]; Shiffman, S.[3]; Li, R.[4]

[1] Department of Applied Psychology, Northeastern University, Boston, USA
[2] Methodology Center, Pennsylvania State University, College Park, USA
3 Department of Psychology, University of Pittsburgh, Pittsburgh, USA
[4] Department of Statistics, Pennsylvania State University, College Park,USA

Intensive longitudinal studies increasingly rely on portable technology to collect data on daily and momentary experiences. In the behavioral & medical fields, an important research question is whether the dynamics of behavior or physiology are predictive of future health outcomes. For example, how do patterns of nicotine withdrawal after a smoking-cessation attempt relate to quitting success? Or, how do patterns of heart-rate variability following stress exposure predict a diagnosis of heart disease? The methodological challenge of answering these types of questions is in the inherent differences in measurement scales: time-intensive longitudinal assessments of covariates and a single-time assessment of a distal outcome. This work introduces an innovative modeling technique called the varying-coefficient regression (VCR) model that allows estimation of such relationships in a flexible and user-friendly manner. The VCR model offers an advantage in comparison to current analytical practices that generally reduce time-intensive covariates to a few summaries (e.g., means, variances, slopes) in order to estimate crude effects of these indices on the outcome. In the course of data reduction, much information is lost, leading to inaccuracies of prediction. In contrast, the VCR model estimates the relationships between time-intensive covariates and an outcome as non-linear functions that capture the magnitude and directionality sequentially along the time continuum. In this approach, time is modeled explicitly, which helps to identify critical periods during which effects of predictors manifest, and describe patterns of change in the effects. Additional features of the model include handling of unbalanced sampling designs (different number of observations and timing across individuals), missing data, and nesting data structure (observations nested within individuals). This presentation targets an applied audience of researchers who collect intensive longitudinal data. To highlight features of the VCR model, research questions, and practical steps of model fitting, the method will be presented in the context of empirical data from a smoking-cessation study (Shiffman et al., 2000). In the study, 247 heavy smokers (average baseline smoking rate = 26.8 cigarettes per day, SD = 9.8) provided momentary assessments of smoking urges, negative affect, abstinence self-efficacy, and presence of other smokers in

their environment at up to 5 random time points throughout a day with electronic diaries for 2 weeks prior to a predetermined quit attempt. The research questions include: (a) what contextual factors affect smoking-cessation outcomes, (b) when in the course of cessation these effects manifest, (c) how the effects change with time, and (d) how long the effects persist. Distal outcomes included the intensity of smoking urges following a quit attempt (a continuous measure) and success of a quit attempt (relapsed or not, a binary measure). Based on the findings, we highlight the time-varying impact that covariates have on important indicators of smoking-cessation success. Furthermore, we illustrate how our novel methodological approach was uniquely able to advance current knowledge of barriers to smoking cessation and to inform tailored, efficient, and cost-effective interventions. The presentation will expose researchers to a novel modeling tool for intensive longitudinal data that can be used for exploration of effects of environmental, psychological, behavioral, and physiological factors on important health outcomes. References to a freely-available code for model fitting will be shared. In conclusion, this work contributes to promoting collection and in-depth exploration of rich records resulting from a variety of methods that collect intensive and, frequently, real-life and real-time assessments in diverse research settings.

Momentary positive and negative affect preceding marijuana use events in youth

Shrier, L.[1] ; Ross, C.[2] ; Blood, E.[3]

[1]*Division of Adolescent/Young Adult Medicine, Boston Children's Hospital, Boston, USA. Department of Pediatrics, Harvard Medical School, Boston, USA*
[2] *Department of Community Health Sciences, Boston University School of Public Health, Boston, USA*
[3]*Clinical Research Center, Boston Children's Hospital, Boston, USA, Department of Pediatrics, Harvard Medical School, Boston, USA*

Marijuana use among youth has been increasing, with recent data on U.S. 12th graders indicating that in past 30 days more than 1 in 5 report any use and nearly 1 in 15 report daily use. Frequent marijuana use at a young age is associated with medical, psychiatric, and social problems in adulthood. It is important to identify modifiable factors associated with marijuana use among youth to develop more effective interventions for this at-risk population. Desire to self-regulate affect, including to maintain or enhance positive affect and to reduce negative affect, may be a primary motivation for use. Young people endorse coping motives for marijuana use, but limited research has examined actual affective states and subsequent marijuana use in the natural environment. Ecological Momentary Assessment (EMA) offers a means of collecting data on experience and behaviors as they occur in real life. EMA research with adolescents and young adults who use marijuana found that as momentary positive and negative affect each increased, marijuana desire increased. Similarly, an EMA study of undergraduates found that momentary anxiety predicted urge to use marijuana, but not actual use. It remains unknown whether momentary positive and negative affect is associated with subsequent marijuana use. This study sought to determine how positive and negative affect differ before marijuana use, compared to other times. We hypothesized: 1. Momentary positive affect is higher or lower than average in the 24 hours leading up to marijuana use. 2. Momentary negative affect is higher than average in the 24 hours leading up to marijuana use. We examined several characteristics of affect, including mean, standard deviation, maximum, and minimum. We explored whether the associations would be strengthened or attenuated over shorter periods before use (12 and 6 hours). We also explored whether being with friends or perceived ease of obtaining marijuana strengthened the associations. Forty medical outpatients ages 15 to

24 who used marijuana at least 2x/week (M = 18.7 years; 56% female) reported momentary experience, including positive affect, negative affect, companionship, perceived ease of obtaining marijuana, and recent marijuana use, several times a day for two weeks, using on a handheld computer. We determined the 24-hour blocks of time leading up to a marijuana use event (n = 314 pre-marijuana blocks). We defined times distant from marijuana use as times that were neither 24 hours or less before nor up to 6 hours after use, when momentary affect would be both experienced and reported under the influence of marijuana (n = 248 distant-from-use blocks). Similarly, we identified 6- and 12-hour pre-marijuana time blocks (n = 275 and n = 299, respectively) and the accompanying distant-from-use blocks (n = 397 and n = 336, respectively). We then determined individual-level z-scores from the mean and standard deviation of each participant's raw affect scores. Within the pre-marijuana and distant-from-use time blocks, we calculated mean momentary positive and negative affect z-scores. Similarly, we determined the standard deviation, maximum, and minimum z-scores within the blocks. Being with friends for a block was defined as the percentage of reports of being with boyfriend/girlfriend or other friends. Perceived ease of obtaining marijuana in a block was defined as the percentage of reports with a response of easy or very easy. Generalized estimating equation models tested associations of mean, standard deviation, maximum, and minimum of momentary positive and negative affect z-scores over 24 hours with subsequent marijuana use. Models adjusted for age, gender, and cannabis dependence. Additional models evaluated the associations 12 and 6 hours before marijuana use. Perceived ease of obtaining marijuana and being with friends were considered as potential moderators. There were no differences in positive affect before marijuana use, compared to other times. Mean, maximum, and minimum negative affect were higher in the 24 hours before marijuana use, compared to other times (adjusted odds ratio [AOR] 1.26, 95% confidence interval 1.10-1.43, p = 0.0006; AOR 1.13, 95% CI 1.04-1.23, p = 0.0044; AOR 1.14, 95% CI 1.02-1.28, p = 0.027, respectively). Mean and minimum negative affect were similarly higher 12 and 6 hours before marijuana use. Being with friends and ease obtaining marijuana did not moderate the associations. The findings support to an affect regulation model for marijuana use among frequently-using youth. Specifically, these youth may use marijuana to manage increased negative affect. Implications for further research and treatment of marijuana use disorders are discussed.

Measurement error effects in diary assessments

Shrout, P.E. ; Lane, S.P.

Department of Psychology, New York University, New York, USA

It is well known that measurement error in predictor variables leads to biased estimates of regression coefficients. For cross sectional studies using regression the observed effect is reduced by a factor of R, where R is the reliability of the independent variable. We show that analogous patterns are found for results from longitudinal studies, but that the size of the bias is a function of two different reliability coefficients. Different effects are seen at the between-person and within-person levels. We also show that measurement error can create lagged effects, whereby today's outcome seems to be affected by both yesterday's and today's processes. This second pattern of bias occurs when the independent variable or the measurement errors are correlated over time. Findings are illustrated using simulated data as well as data from a five week diary study of the association of relationship moods with undifferentiated moods.

A therapeutic application of experience sampling in the treatment of depression – Part 1: A randomized controlled trial examining effectiveness and feasibility

Simons, C.J.P.[1] ; Kramer, I.[1] ; De Wild-Hartmann, J.A.[1] ; Van Os, J.[2] ; Wichers, M.[3]

[1]Department of Psychiatry and Psychology, School of Mental Health and Neuroscience, Maastricht University Medical Centre, The Netherlands. GGzE, Institute of Mental Health Care Eindhoven en de Kempen, Eindhoven, The Netherlands
[2] Department of Psychiatry and Psychology, School of Mental Health and Neuroscience, Maastricht University Medical Centre, The Netherlands. King's College, King's Health Partners, Department of Psychosis Studies Institute of Psychiatry, London, United Kingdom
[3]Department of Psychiatry and Psychology, School of Mental Health and Neuroscience, Maastricht University Medical Centre, The Netherlands

Mental health clinical practice may benefit from a monitoring system that provides prospective, daily life and context-related information on changes in affect and experiences. Momentary ambulatory assessment studies have demonstrated that ambulatory monitoring of mental states may improve prediction of treatment-response and relapse in depression. Momentary assessment technology (MAT) can be used to deliver personalized feedback on dynamic patterns of affect, yet there is little prior application in psychiatric disorders. The present study examined the effectiveness and feasibility of MAT-based personalized feedback in the treatment of depression based on a recently conducted randomized controlled trial in 102 depressed patients. The MAT-based intervention consisted of MAT-monitoring combined with MAT-based feedback that was given during six weekly feedback sessions in addition to treatment as usual (TAU). The feedback sessions focused on positive affect and its contextual embedding (daily life activities, events and social situations) and was given verbally, written, and graphically (in pie charts and bar graphs) to the patient. The MAT-based feedback intervention was compared to i) MAT-monitoring only (i.e. without feedback; pseudo-experimental group) in addition to TAU; and ii) TAU only (control group). The Hamilton Depression Rating Scale was used as a primary outcome measure and was assessed at several moments pre- and post intervention with a follow-up period of 24 weeks. The results suggested that the MAT-based feedback intervention resulted in a long-term (24 weeks) clinically relevant and significant reduction of depressive symptoms, which was not evident in the pseudo-experimental and control groups. The RCT also provided evidence of acceptability of MAT in depressed patients.

Stress, implicit processes, and craving in alcohol dependence: designing an ecological momentary assessment study

Snelleman, M.[1] ; Schoenmakers, T.M.[1] ; Van de Mheen, D.[1] ; Waters, A.J.[2] ; Franken, I.H.A.[3]

[1] *IVO Addiction Research Institute, Rotterdam, The Netherlands. Department of Public Health, Erasmus Medical Centre, Rotterdam, The Netherlands*
[2] *Department of Medical and Clinical Psychology, Uniformed Services University of the Health Sciences, Bethesda, USA*
[3] *Institute of Psychology, Erasmus University, Rotterdam, The Netherlands*

Rationale: Relapse during or after treatment for alcohol dependence is a widespread phenomenon. Up to now, research has shown that stress, impulsivity and uncontrolled processes that influence behavior (implicit cognition), like a heightened attention for alcohol-related stimuli and implicit memory associations for approaching alcohol, cause a greater risk for craving, temptation and relapse. It is still unclear how these factors interplay to increase or reduce the risk for relapse. By unraveling this relapse process, we will be able to reduce the risk for relapse by changing treatment programs for this disorder. Objective: The objectives of this study are to examine the interplay of implicit processes, mood and stress, and putative external triggers when abstinent alcohol-dependent patients experience temptation to drink or when they (re)lapse. Study design: The study is based on Ecological Momentary Assessment (EMA). We will administer a personal digital assistant (PDA) to alcohol-dependent subjects approximately six weeks after the start of their outpatient treatment program. The PDA's are scheduled to give a signal three times a day at random times, after which participants complete a brief assessment of the above mentioned factors; these are the Random Assessments (RAs). Also, participants are asked to initiate an assessment by themselves when they experience significant craving or are tempted to drink alcohol. The assessments consist of two parts: the first part concerns questions about current mood and stress, motivation to stay abstinent and whether alcohol was consumed since the previous assessment (lapse/relapse). In the second part, an implicit reaction time task is presented. This is either an alcohol Stroop task or an approach-avoidance Implicit Association Task (IAT). The presentation of either the Stroop or the IAT will be at random. Participants will carry the PDA for four weeks, each week they will meet with the researcher for feedback, a technical check of the PDA, and to follow up on compliance. Also, participants will be asked about their alcohol use in the past week, to see whether reports on the PDA corroborate with self-reported drinking.

The relationship of community functioning to community participation in individuals with schizophrenia spectrum disorders

Snethen, G.S.[1] ; McCormick, B.P.M.[2]

[1] *Department of Rehabilitation Sciences, Temple University, Philadelphia, USA*
[2] *School of Public Health, Indiana University, Bloomington, USA*

Measurement of psychosocial functioning among individuals with schizophrenia spectrum disorders (SSD) is problematic (1), as most instruments rely upon self-report, direct observation, clinician ratings, or proxy reporting (2). Therefore, Patterson et al. (2) created the UCSD Performance Based Skills Assessment (UPSA) to be a direct measure of community functioning. Research indicates individuals with SSD have difficulties generalizing skills between

environments, thus the purpose of this study was to compare community functioning, as measured by the UPSA, of individuals with SSD to reported activity participation. Methods Participants Forty-five individuals with a SSD were recruited from a Veterans Administration Hospital and a community mental health center in a mid-sized, Midwestern, United States city. Measurements and Procedures Diagnosis was confirmed using the Structured Clinical Interview for DSM-IV-TR (SCID; (3), neurocognition was assessed with the Wisconsin Card Sort Test (WCST), community functioning was assessed with the UPSA, and participation was measured using experience-sampling method (ESM) (4). Analysis Activity reports from ESM were coded into place and activity categories. Place codes included: home, community, hospital, and other. Activities were coded using ICF Activity and Participation chapter codes. An additional "smoking" designation was also used. Outcomes related to ICF chapter and activity location were examined using hierarchical linear modeling (HLM) with the UPSA total score and neurocognition as predictors. Results Thirty-three participants completed a minimum of 17 of the 49 ESM signals (Range 17-46, Mean=33.67); with a total of 1,109 codable signals. UPSA total score mean was 75.1 (sd=15.4) with a range 33.8-95.96. Location The majority of activities (59.7%) occurred within the home, thus home was used as the reference category. In the unconditional model, the log odds of participating in community (y00(1)=-1.014, t=-4.853, p<.001) and hospital (y00(2)=-1.507, t=-4.780, p<.001) activities were significantly less than participating in home based activities. There is statistically significant variation between participants in the log-odds of community (ICC=.008, p<.001) and hospital (ICC=.009, p<.001) based activities, which supports the use of a nested model. The conditional model examined the likelihood of participation in the outcome categories when considering community functioning (UPSA), cognitive functioning (WCST), and diagnosis (SCID). Findings indicated the log odds of neither categories were significantly different from participating home based activities. Activity Chapter 9, Community, Social, and Civic Life, of the ICF was the most frequently identified activity (n=363, 33%), and was selected as the reference variable. The log odds of smoking (y00(1)=-2.9, t=-8.774, p<.01), communication (y00(2)=-2.5, t=-8.94, p<.01), mobility (y00(3)=-1.106, t=-5.32, p<.01), domestic life (y00(5)=-1.16, t=-7.424, p<.01), and major life areas (y00(6)=-2.2, t=-6.26, p<.01) were significantly less than the frequency of participation in Community, Social, and Civic Life activities. There was significant variation between participants in the log-odds of smoking (ICC= .015, p<.001), communication (ICC=.016, p<.001), mobility (ICC=.009, p<.001), self-care (ICC=.004, p<.001), domestic life (ICC=.006, p<.01), and major life areas (ICC=.013, p<.001), which supports the use of a nested model. The conditional model examined the likelihood of participation in the outcome categories in reference to participation in Chapter 9 activities, with community functioning (UPSA), cognitive functioning (WCST), and diagnosis (SCID) as predictors. In the conditional model, only the log odds of communication (y00(2)=-3.488, t=-2.023, p<.01), mobility (y00(3)=-2.749, t=-2.326, p<.01), and domestic life (y00(5)=-2.582, t=-2.290, p<.01) were significantly less than that of participating in Chapter 9 activities. Considering level 2 variables, UPSA and WCST were not significant in changing the odds of participation. However, a diagnosis of schizoaffective disorder was significantly, positively related to participation in domestic life activities (OR 2.073). Discussion UPSA total score and neurocognition did not predict differences in participation in everyday life. Although the authors (2) contend the UPSA is a measure of community functioning, the results of this study raise questions if it measures capacity or real world performance. This study supports two distinct findings: 1) the UPSA may be better categorized as a measure of functional capacity and 2) one's capacity to function within the community may not be predictive of participation (5).

The Oxytocin receptor genetic variation, affect similarity and empathy between married couples: An experience sampling study using mobile phones

Song, Z.[1] ; Wang, N.[1]; Saw, S.M.[2]

[1]*Department of Management and Organization, National University of Singapore, Singapore*
[2]*School of Public Health, National University of Singapore, Singapore*

Background. The neuropeptide oxytocin (OT) is one of the most-studied neurotransmitter and hormone that encodes information relevant to social behavior. In humans, a SNP of the *OXTR* gene (rs53576) has been found functionally relevant to some psychiatry disorders, as well as social interaction and stress reactivity. More specifically, the GG genotype of rs53576 was found to be associated with higher empathy levels and lower stress reactivity in both males and females than AA/AG genotypes (Rodrigues et al., 2009). The current study adopted the experience sampling method (ESM) to track affective experiences of spousal pairs. We examined relationships between *OXTR* rs53576, affect similarity and affective empathy between husbands and wives using their synchronized momentary reports. Methods. One hundred twenty three pairs of Singaporean parents with Chinese ancestry were asked to complete momentary surveys four times a day for seven days using their cell phones. The survey asked them to report their momentary stress encountered and affect experienced. When they were together with their spouses, they were asked also to report perceived spouses' affect. In total, 4,941 usable momentary responses were received. Among these observations, 682 paired reports indicated that both husbands and wives were together when responding the survey, which included items of their own affect, as well as perceived affect of their spouses. The gene was extracted from blood samples and Illumina's Sentrix Humanhap 610 Genotyping BeadChip was used for genotyping. Results. Using mixed models, we found that *OXTR* rs53576 influences mood similarity and empathic accuracy within couples for negative affect. However, we found that A allele, instead of G allele, was more likely to associated with higher mood similarity and empathic accuracy. No such effects were found for positive affect. Discussion. Using experience sampling approach, our study provides further evidence to support that OXTR gene is important in regulating emotional reactions and empathy. Our findings on paired mood of couples suggest that A allele relates to mood similarity and empathy accuracy more than G allele. These findings were inconsistent with Rodrigues et al (2009). We are conducting another large scale ESM study in Germany to examine the potential racial difference in the genetic effect of the *OXTR* gene. Conclusion. Findings of the current study show that the marriage of the ambulatory assessment and genetic approaches can lead to interesting discoveries

Capturing dyadic interpersonal interactions with mobile phone surveys

Song, Z.[1]; LI, X.[1]; Sun, S.[2]

[1]*Department of Management and Organization, National University of Singapore, Singapore*
[2]*Department of Organization and Strategy, School of Business and Economics, Maastricht University, Maastricht, The Netherlands*

Introduction Interpersonal interaction forms the basis of human society. Dyadic face-to-face interaction is the most common and fundamental form of interaction. In the work place, dyadic interaction between supervisors and

subordinates also forms the basis of organizational management. However, only a limited number of studies have directly investigated the interactional process between supervisors and their subordinates, mainly in the academic area of business communication and using qualitative discourse analysis. The current study pioneered to follow two parties over time, and used dyadic mobile surveys to record their interactions happened in nature settings. Design/Methodology We used event-contingent experience sampling method (Wheeler & Reis, 1991). We installed electronic questionnaires into participant's cell phones (Song, Foo, & Uy, 2008) and required them to respond immediately after having interaction with their leaders (or members). Responses from leader and member were matched. In this way, we were able to examine leader and member's interaction experiences in naturalistic settings and reduce biases that resulting from retrospective reconstruction. We collected data from five Small-Medium Enterprises (SMEs) in China. All five companies were in the IT industry. We contacted a total of 45 middle-level managers and 135 employees as participants in the current study. To be qualified for the study, leaders must have at least three employees reporting directly to them. After inviting leaders, we randomly selected three employees reporting to each leader to participate in the study. For a period of 10 working days in two weeks' time (including extra working hours), participants were required to respond to the mobile survey within one hour after the interaction with their leaders or employees. To facilitate data collection and increase response rate, we sent SMSs reminders to participants. Two research assistants monitored the system from 8:30am to 9:30pm on each working day. They checked the system every 30 minutes and send SMS reminders to corresponding participants once responses from either a leader or an employee showed up in the system. Among the 45 leaders and 135 employees, 45 leaders (100%) and 124 employees (92%) submitted a total number of 1849 responses. 1586 (86%) of these responses were successfully matched which resulted in 793 pairs of responses, with the average of 6.4 pairs per dyad. After the data cleaning, 641 paired responses from 36 leaders (80%) and 81 employees (60%) remained, resulting an average of 7.92 paired responses per dyad. Hypotheses were tested using Multilevel Structured Equation Modelling (MSEM), which is recommended by Preacher, Zyphur and Zhang (2010). Results We found that leaders and members who were in high quality relationship were more likely to have positive interaction experiences. Such positive interaction experiences, in turn, enhanced high quality relationship reported in two weeks later. We also found that leader and member's interaction experiences mediated the relationship between their relationship quality reported in the baseline and short-term outcomes such as state affect and momentary job satisfaction. In comparison, leader and members' relationship quality mediated the relationship between interaction experiences and long-term outcome such as member's general job performance. Discussion Findings of this paper have important theoretical implications in study interpersonal relationship and interaction. First, while relationship quality provides the basis for interactions taken place between leader and member, these interactions also provide feedbacks which shape their perceptions of relationship quality in return. The important role that interaction plays in the dynamic process of relationship quality change deserves more in-depth investigation by future studies. Second, previous studies exploring the outcomes of relationship quality focused primarily on the long-term outcomes. The mediational structure proposed in the current paper pointed out a way through which relationship quality can cast influence on short-term outcomes –through interactions, which confirms that examining leader-member relationship from an "interactional" perspective is promising. Mobile phone survey was proved in the study a suitable method to study interpersonal interaction. The communication capacity of mobile phone enabled active tracking of dyadic responses and reminding, which are necessary conditions to conduct naturalistic dyadic interaction survey studies. Conclusion The study pioneered to apply the dyadic event-contingent experience sampling method to record dyadic interactions in natural settings. We believe other research fields of dyadic relationship, such as marriage relationship, friendship, employee-customer, can be benefited by adopting this survey strategy.

Musicians' psychophysiological activation before, during, and after performance and the moderating effect of anxiety

Studer, R.K.S.[1] ; Danuser, B.D.[1] ; Wild, P.W.[2] ; Hildebrandt, H.H.[3] ; Gomez, P.G.[1]

[1]*Institut for Work and Health, Lausanne, Switzerland*
[2]*Institut national de recherche et de sécurité (INRS), Nancy, France*
[3] *Swiss University Centre for Music Physiology, Zurich University of the Arts, Zurich, Switzerland*

Purpose: A comprehensive view on the time dynamics of the psychophysiological responding in a music performance context and how this responding is influenced by music performance anxiety (MPA) is largely lacking. The present study aimed at assessing (a) the affective experience, self-perceived somatic symptoms, and cardiorespiratory parameters and (b) the moderating effect of MPA before, during, and after a private and a public performance in 66 music students. Method: Participants underwent individual testing during three sessions (baseline, private, public), each separated by approximately one week. The private and the public sessions encompassed a warm-up phase to tune the instrument or the voice, a pre-performance phase (in a preparation room), a performance phase (in an adjacent concert room), and a post-performance phase (again in the preparation room). Each phase lasted for approximately 10 minutes. The only difference between the private and the public session was the presence of an evaluative audience and an audio recording of the performance in the public session, whereas the musicians were performing alone in the private session. All sessions took place in music schools. The electrocardiogram, respiratory volume and time parameters, and accelerometer ACC data were assessed with the LifeShirt system (VivoMetrics, Inc, Ventura, CA), a noninvasive ambulatory assessment device acquiring and storing data continuously. The LifeShirt is a snugly fitting t-shirt using respiratory inductive plethysmography. End-tidal pCO2 (PetCO2) was recorded by means of a nasal canula connected to a nondispersive infrared CO2 monitor (Microcap Handheld Capnograph; Oridion Medical 1987 Ltd, Jerusalem, Israel). Results: Heart rate, minute ventilation, and all self-report variables (anxiety, tension, shortness of breath, difficulty breathing, palpitations, trembling, sweaty hands) increased in the public session compared to the private session. Furthermore, all variables were higher (respectively lower for the total breath duration) during the performances than before or after. The differences between the phases were larger in the public than in the private session for almost all variables. After the public performance, minute ventilation and heart rate did not recover to the same levels as after the stress-free private performance session. Finally, while higher MPA scores were associated with higher scores and with larger changes between sessions and phases for self-reports, this association was less coherent for the physiological variables. PetCO2 increased from the private to the public session for musicians with low MPA levels and decreased for musicians with high MPA levels; heart rate, minute ventilation and total breath duration did not show MPA-dependent differences in the response pattern between the private and the public session. Conclusion: This study makes a novel contribution by showing how the presence of an audience influences low- and high-anxious musicians' self-reported affective experience, somatic symptoms, and cardiorespiratory parameters before, during, and after a performance. The hypothesis of a hyperventilation tendency in high-performance-anxious musicians is supported. Yet, overall, the findings are more consistent with models of anxiety that emphasize the importance of cognitive factors as opposed to physiological ones in the experience of MPA. Keywords: psychophysiology; performance; musicians; music performance anxiety (MPA); stage fright; reactivity; recovery

Towards a universal platform for ambulatory assessment

Stumpp, J.

Movisens, Karlsruhe Germany

This talk will present a platform tailored for researchers in the field of ambulatory assessment. The platform takes advantages of recent web and smartphone technologies to make psychological, behavioral, physiological, and environmental assessments easier and more convenient for researchers and study participants. The presentation will include discussion of the design goals of the platform and introduce a unified language to describe and visualize experience sampling schemas that researchers can customize and share with others. The current state of the platform will be shown, including a demonstration, and future trends and plans for extensions will be discussed.

Attentional bias amplifies the negative emotional influence of daily stressful events

Takano, K.T.[1] ; Iijima, , Y.I.[2] ; Tanno, Y.T.[2]

[1]*College of Humanities and Sciences, Nihon University, Tokyo, Japan*
[2]*Graduate School of Arts and Sciences, The University of Tokyo, Tokyo, Japan*

Anxiety is associated with attentional bias to negative stimuli, such as greater engagement of attention in the vicinity of threat cues and/or slower disengagement from threat cues (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van Ijzendoorn, 2007). Experimental studies have suggested that attentional bias toward negative information may affect emotional vulnerability, with indicating that greater attentional bias is associated with increased negative emotional reactions to a subsequent stressful event (e.g., MacLeod, Rutherford, Campbell, Ebsworthy, & Holker, 2002). However, we have still little knowledge about what influence attentional bias exerts on our daily experiences. Investigating how attetnional bias is manifested in daily life would contribute to elucidation of cognition-by-emotion interaction underlying anxiety in an ecologically valid manner. Thus, the present study examined the association between attentional bias and daily anxious mood using dot-probe task (MacLeod, Mathews, & Tata, 1986) and experience sampling method (ESM; Csikszentmihalyi, & Larson, 1987). Forty-five undergraduates participated in the present study. Attentional bias to negative information was assessed using dot-probe task. In this task, participants were presented with pairs of stimuli consisting of negative (i.e., angry) and neutral faces on a PC screen. Following the offset of each stimulus, a small dot probe could appear in the location previously occupied either face. Allocation of attention was measured by participant's latency to detect the probe, and the extent of attentional bias was indexed by the difference in the latencies between the congruent (the probe appears in the same location with the negative stimulus) and incongruent conditions (the probe appears in the opposite location to the negative stimulus). After this laboratory session, participants entered an ESM sampling phase, in which each participant was required to report their current mood, activity, and stressful event through a mobile phone 10 times a day for consecutive six days at semi-random intervals. Multilevel modeling analyses indicated a significant interaction effect between attentional bias score and occurrence of stressful event in predicting the momentary level of anxious mood, which

suggests that individuals with greater attentional bias to threatening stimuli experienced increased anxious mood after a stressful event (B = 1.45, SE = 0.20, t = 7.29) than those with less attentional bias (B = 0.93, SE = 0.20, t = 4.54). These findings show that attetnional bias to negative information might serve as cognitive vulnerability of anxiety with amplifying the negative emotional reactivity to a daily stressful event. As a possible mechanism, greater engagement in and slower disengagement from stress-related negative stimuli may contribute to excessive and uncontrollable processing of negative information such as worry, which leads to exacerbation of anxiety.

Development of a wireless body area network (WBAN) for assessing emotion dysregulation, craving, and alcohol use

Trull, T.J.; Baskett, P.; Ravi, S.; Lander, S. ; Shang, Y.

Psychological Sciences, University of Missouri, Columbia, USA

We discuss the use of ambulatory assessment (AA) to describe and investigate alcohol use and dependence-related symptoms (specifically, cue-reactivity/craving), and mood dysregulation among psychiatric outpatients with disorders characterized by clinically significant emotional dysregulation problems (e.g., mood disorders, anxiety disorders, or borderline personality disorder) while in their natural environment. First, we briefly discuss findings that have used an electronic diary to investigate to assess affect and alcohol use. Next, we will discuss the development of a Wireless Body Area Network (WBAN) system for assessing emotion dysregulation, craving, and substance use. This system uses two particular types of ambulatory assessment devices: (1) smart phones that can prompt participants and record self-reported responses to standardized queries (and sense both behavior and context), and (2) wireless physiological monitoring devices that are worn by participants (measuring electrodermal, cardiac, and respiratory activity). The smart phones will interact with the wireless devices and serve as access points for the wireless sensors allowing for the collection and transmission of data in near real-time (i.e., an access point for a Wireless Body Area Network; WBAN). Specifically, an Android-based smart phone serves as the access point through which psychophysiological data are streamed in real-time from electrodermal, cardiac, and respiratory activity sensing devices that have Bluetooth capabilities. In addition, patients will complete brief surveys on the smart phones when prompted randomly and also will initiate reports of mood swings, craving, and alcohol use. We will discuss the stages of development of the WBAN, testing the reliability and validity of the system, and present preliminary data on patients that have completed our protocol.

Don’t cry! My heart is racing. Heart rate and sensitive responding to infant crying

Van der Veen, R. ; Voorthuis, A.; Bhandari, R.; Out, D.; Van IJzendoorn, M.

Centre for Child and Family Studies, Leiden University, Leiden, The Netherlands

Infant crying is alerting and should attract parents’ attention to alleviate the child’s distress. It can however also evoke negative emotions and trigger abuse and neglect. The physiological response to infant crying is thought to play an important role in the perception of cry sounds and (intended) care giving, being sensitive or harsh. Studying

response to crying raises several issues. Children do not cry on command, making the comparison between mother-child dyads difficult and response to recorded cry sounds lack the possibility to measure sensitive responding. In our study we have examined adults' cardiac reactivity to infant cry sounds in a controlled setting. We developed an ecologically valid but standardized setting, the Leiden Infant Simulator Sensitivity Assessment (LISSA). In this assessment, an infant simulator with interactive features (Realityworks, Inc) is used and heart rate is monitored with the VU-AMS, allowing free movement. The infant simulator resembles a real infant in appearance and it produces crying sounds that are life-like, beginning with fussing and progressing to more intense crying. Participants took care of the infant simulator in a 30-min lab session with increasing competing demand. Sensitive parenting behavior was coded with the Ainsworth Sensitivity Scale (Ainsworth et al., 1974), and covered the whole range of the scale (1-9). Heart rate was measured using the VU-AMS. We are currently analyzing the heart rate response to crying in relation to sensitive responding.

Beyond actigraphy: Discovery of routines and activities with wearable sensors

Van Laerhoven, K.

Embedded Sensing Systems, Technical University Darmstadt, Darmstadt, Germany

Propelled by a rapidly expanding market in personal devices, sensing and processing elements have become small and efficient enough to enable new wearable technologies that can detect when the wearer performs particular activities, including how well and how frequently they occur. These types of systems are promising in their ability to obtain information that might provide new insights into the behaviors of living subjects in their natural environments. However, these system are also challenging since they need to be fast, adaptive, small-scale, robust, and power-efficient to be deployed for long stretches of time in the real-world. This talk will focus on the current state-of-the art in wearable activity recognition research and illustrate, using several projects at TU Darmstadt, what is currently feasible, where the promises and bottlenecks lie, as well as what achievements can be expected in the coming years.

The role of sympathetic and parasympathetic activation in sAA secretion during exercise

Van Lien, R.

Department of Biological Psychology, VU University Amsterdam, Amsterdam, The Netherlands

Salivary alpha amylase (sAA) secretion has gained interest as a potential non-invasive biomarker for activity of the sympathetic nervous system (SNS). Changes in sAA secretion are often measured by changes in sAA enzymatic activity. However, the parasympathetic nervous system (PNS) can also affect sAA activity through its effects on salivary fluid secretion, sAA secretion in non-SNS innervated glands, and synergistic enhancement of SNS effects on sAA secretion. The current study examined the relative role of sympathetic and parasympathetic activation in sAA secretion during exercise testing, which elicits a well-known pattern of autonomic activation. Twenty-eight subjects

underwent exercise testing with continuous recording of impedance-based cardiac sympathetic and parasympathetic activity and repeated saliva collection using the spitting method. Exercise-induced changes in sAA enzymatic activity as well as changes in sAA protein content were assessed. These measures were converted to reflect true changes in sAA secretion by multiplying by flow rate. Total salivary protein changes were also assesed to test the specificity of sAA reactivity compared to that of other salivary proteins. Subjects with large exercise-induced cardiac SNS activation paired to small PNS inactivation, i.e. a state of relative high co-activation in the autonomic space, had high sAA activity, whereas subjects with small exercise-induced cardiac SNS activation paired to a relatively strong PNS inactivation, i.e. a state of relative low co-activation, had low sAA activity. Importantly, these exercise effects on sAA activity disappeared after adjustment for concurrent changes in salivary flow rate and were no longer present repeated in SAA secretion measures. Only the ratio of sAA to total salivary protein secretion remained significantly correlated to PNS activation (.441). Overall, the findings indicate that sAA secretion is not a selective indicator of SNS activation, but instead appears to be more strongly associated with PNS activation.

Estimated preejection period (PEP) based on the detection of the R-wave and dZ/dt-min peaks does not adequately reflect the actual PEP across a wide range of laboratory and ambulatory conditions.

Van Lien, R.

Department of Biological Psychology, VU University Amsterdam, Amsterdam ,The Netherlands

The current study evaluates the validity of estimating PEP from fixed value for the Q-wave onset to R–wave peak (QR) interval and an R-wave peak to B-point (RB) interval that is estimated from the R-peak to dZ/dt-min peak (ISTI) interval. Ninety-one subjects participated in a 90 minute laboratory experiment in which a variety of often employed physical and mental stressors were presented and 31 further subjects participated in a structured 2 hour ambulatory recording in which they partook in natural activities that induced large variation in posture and physical activity. PEP, QR interval, and ISTI were scored and rigorously checked by interactive inspection. Across the very diverse laboratory and ambulatory conditions the QR interval could be approximated by a fixed interval of 40 ms but 95% confidence intervals were large (-26.53 – 53.37 ms). Multilevel analysis showed that 79% to 81% of the within and between-subject variation in the RB interval could be predicted by the ISTI with a simple linear regression equation. However, the optimal intercept and slope values in this equation varied significantly across subjects and study setting (laboratory versus ambulatory) and Bland Altman plots revealed a large discrepancy between the estimated PEP using the R-wave peak and dZ/dt-min peak and the actual PEP based on the Q-wave onset and B-point. We conclude that the PEP estimated from a fixed QR interval and the ISTI could be a useful addition to the psychophysiologist's toolbox, but that it cannot replace the actual PEP to index cardiac sympathetic control.

Emotional reactivity to positive and negative events in the course of MDD

Van Winkel, M.

Department of Psychiatry & Neuropsychology, School for Mental Health & Neuroscience, Maastricht University, Maastricht, The Netherlands

Background: Emotional reactivity to negative and positive events in major depressive disorder (MDD) is a topic of growing interest. An earlier study showed that individuals with MDD, compared to healthy controls, had a blunted emotional reactivity to negative events in everyday life. More surprisingly, a mood-brightening effect was found in individuals with MDD in response to positive events, with larger increases in positive affect (PA) and decreases in negative affect (NA). Others replicated these findings, but until now, no longitudinal follow-up measurements were available to elucidate how emotional reactivity to positive and negative events might change following standard treatment. Aim: To investigate possible changes in emotional reactivity to positive and negative events in the daily life of individuals treated for MDD, in relation to clinical course. Method: Thirty individuals with MDD participated in an experience sampling (ESM) study prior to treatment and again after 18 months. Between the two ESM measurements, participants were monitored for depressive symptoms monthly, with the Hamilton Depression Rating Scale (HDRS). Results: After 18 months 11 out of 30 participants were recovered from MDD according the HDRS. Multilevel regression analyses showed decreased PA responses and enhanced NA responses to negative events in participants who were still depressed at 18-month follow-up. No significant changes in emotional reactivity to positive events were found at 18-month follow-up. Conclusion: Emotional reactivity to positive and negative events changes over time in depressed individuals in relation to the clinical course of MDD.

Experience sampling as an informative approach to study gene-environment interaction in non-affective psychosis

Van Winkel, R.

Department of Psychiatry, KU Leuven, Leuven, Belgium

Background. Paranoia is a core symptom of schizophrenia and is also highly prevalent in affective and anxiety disorders. Previous evidence shows that both genetic vulnerability and social stressors are important in the formation of paranoia. This study aimed to investigate possible interactions between social stress and relevant single nucleotide polymorphisms (SNPs). Method. Paranoid reactivity to social stress was measured using the Experience Sampling Method in five different samples across the paranoia continuum (total n=811). 31SNPsemerging from either agnostic genome-wide association studies of relevant phenotypes or from previous candidate gene-environment interaction studies were selected. Replicated interactions at p<.05 in two healthy subsamples (1. healthy control group [n=112] and 2. female general population twin sample[n=380]) were followed-up in an at-risk (unaffected siblings of psychotic patients, n=86) and two patient samples (1. schizophrenia [n=108]and 2. depression[n=125]) for further assessment of etiological and clinical relevance. Results. 7 SNPs moderated the effects of social stress on paranoia in both healthy samples (p<.05); rs3803300 in AKT1, rs362584 in SNAP25 and 5 SNPs in the Major Histocompatibility Complex (MHC). Rs3803300 in AKT1 also moderated paranoia in the unaffected siblings and the psychotic patients, whereas the five MHC-SNPs moderated paranoia in the patients with remitted depression. Conclusions. Genetic variation in AKT1, and

possibly also in the MHC region, is important in explaining individual differences in paranoid reactivity to social stress, a fundamental psychological mechanism of relevance across traditional diagnostic boundaries.

Reduced parasympathetic activity is associated with an adverse cardio metabolic profile at age 5-6 years: The ABCD-study

Vrijkotte, T.G.M.[1] ; Hoekstra, C.[1] ; Gademan, M.J.G.[1] ; Van Eijsden, M.[2] ; De Rooij, S.R.[3] ; Van den Born, B.J.H.[4] ; Twickler. M.T.B.[5]

[1]*Department of Public Health, Academic Medical Center - University of Amsterdam, Amsterdam, The Netherlands*
[2] *Department of Epidemiology, Documentation and Health Promotion, Public Health Service of Amsterdam (GGD), Amsterdam, The Netherlands*
[3]*Department of Clinical Epidemiology, Biostatistics and Bioinformatics, Academic Medical Center, Amsterdam, The Netherlands*
[4]*Department of Vascular Medicine, Academic Medical Center, University of Amsterdam, Amsterdam, The Netherlands*
[5]*Department of Endocrinology, Diabetology and Metabolic Diseases, Antwerp University Hospital, Antwerp, Belgium*

Background In adults, increased sympathetic and decreased parasympathetic nervous system activation are associated with an atherogenic metabolic profile. Our aim was to assess whether these alterations in the autonomic nervous system activation are already present in early childhood. Methods Cross-sectional data were collected within the ABCD-study, a multi-ethnic birth cohort in Amsterdam (inclusion during pregnancy 2003-2004) at age 5-6 years. Heart rate (HR), pre-ejection-period (PEP; sympathetic activity) and respiratory sinus arrhythmia (RSA; parasympathetic activity) were measured during 6 minutes supine position with the VU-AMS. Fasting blood samples were collected by finger stick method. Metabolic components were waist-height ratio (WHtR), triglycerides (TG), fasting glucose, systolic blood pressure (SBP) and HDL cholesterol. Separate components as well as the combination indicating an adverse metabolic profile (cumulative metabolic score) were analyzed continuously as well as dichotomously by multivariable linear and logistic regression analyses. Results were adjusted for time of the day at measurement, socioeconomic status, ethnicity, child's sex, age, sport participation, amount of computer and TV time, hours of sleep and general anxiety. Results 1540 children were included. The mean (SD) HR, RSA and PEP levels were 87.5 (9.3) bmp, 121.6 (62.7) msec and 70.9 (9.1) msec, respectively. In adjusted models, increased HR and decreased RSA were associated with a higher WHtR ($P < 0.01$), a higher SBP ($P < 0.01$) and a higher cumulative metabolic score (HR: $P < 0.001$; RSA: $P < 0.01$). Lower PEP was only associated with higher SBP ($P < .005$). When metabolic variables were examined as dichotomous outcomes, a 10 beats/minute increase in HR was associated with an increased risk of high WHtR (OR=1.36;95%CI:1.08-1.72, $P < 0.01$) and pre-hypertension (OR=1.84;95%CI:1.52-2.22, $P < 0.01$). In addition, each 10 ms decrease in RSA was associated with an increased risk for high WHtR (OR=0.95;95%CI:0.91-0.99, $P < 0.01$) and pre-hypertension (OR=0.97;95CI:0.94-1.00, $P < 0.05$). 4.7% of the children had three or more (out of five) adverse metabolic components. Higher HR (per 10 bpm) increased the risk for such an adverse clustering of metabolic components (OR=1.57;95%CI:1.19-2.06, $P < 0.05$). Conclusion This study shows that increased heart rate and decreased parasympathetic activity are associated with a less favorable metabolic profile already at age 5-6 years.

Smartphone based ambulatory assessment of health risks: literature review

Wac, K.

Institute of Services Sciences, University of Geneva, Switzerland

Objectives: Increasingly, we use emerging mobile computing and communications technologies enclosed in smartphones for diverse activities in our daily life, for example for entertainment, education, or information purposes. In our research, we aim to evaluate the feasibility of using smartphone applications to assess lifestyle-associated health risks of its owner. It is because we observe that a pattern of diseases in changing from infectious diseases or accidents to slow and invisible invalidating chronic diseases caused by poor lifestyle choices and unhealthy behaviours cumulating over time. Our research provides an overview of current trends in smartphone applications, enabling the provision of personal, pervasive health risks assessments services. Methods: We have reviewed examples of these trends from the PubMed and Google scholar literature search engines, which, by no means claim to be complete, as the field is evolving and some recent advances may not be documented yet. Results: There exist critical technological advances in the surveyed smartphone technologies, employed in provision and improvement of monitoring and diagnosis services to assess lifestyle-associated health risks of its owner in physical (e.g., sleep, nutrition), cognitive (e.g., short term memory) or mental health (e.g., depression) areas. One of the recent smartphone applications in this field enable health risks assessments for complex conditions like cancers or dementia. The most emerging trend relates to a routine application of these technologies in a prevention/wellness sector, helping its users in self-care to stay healthy. Conclusions: Smartphone-based personal health informatics services exist, but the main challenge for their widespread adoption involve lack of user acceptance striving from variable credibility and reliability of applications as they lack evidence-based approach, and may turn to do more harm than good for their users.

Use of ecological momentary assessment for cognitive assessment and intervention in addiction

Waters, A.J.; Kerst, W.

Uniformed Services University of the Health Sciences, Aimee Ruscio, Bethesda, USA

Ecological Momentary Assessment (EMA) has been widely used to study addiction. This research has relied primarily on self-report measures (patient-reported outcomes). The current paper reviews two studies that examined the potential of using mobile devices for 1) assessment of cognition using reaction time tasks, and 2) for delivery of cognitive interventions. Cognitive processes underlying drug use have usually been assessed in controlled laboratory settings. More detailed and valid data may be possible if assessments are conducted in a naturalistic setting. Both automatic (implicit) cognitive assessments and measures of executive function can be assessed. The paper will briefly present data from published studies from our laboratory illustrating the use of mobile devices to administer a number of cognitive assessments, including the modified Stroop task, the visual probe task, and the Implicit Association Test (IAT). The paper will then briefly describe two studies that used mobile devices to administer a cognitive intervention and to assess cognition in non-treatment seeking smokers.
The first study was a parallel group randomized controlled trial of Attentional Retraining (AR) for smoking. AR trains

addicts to attend away from drug-related cues. Therefore AR may reduce exposure to drug cues and reduce craving. Adult community smokers (N=60) not seeking to quit were randomly assigned to an AR group or control (no training) group. They were instructed to smoke as much or as little as they liked during the study. They carried a personal digital assistant (PDA) with them for one week. They were prompted to complete 4 assessments at random times (RAs) daily, including 3 attentional retrainings (AR group) or 3 control trainings (control group). AR was implemented using a modified visual probe task. Attentional bias was assessed once per day using a standard visual probe task on the PDA. The AR group completed 434 attentional retrainings (mean = 15.0) and 146 assessments on the PDA, and the control group completed 448 Control trainings (mean = 14.9) and 145 assessments on the PDA. At baseline, participants exhibited significant attentional bias to smoking cues. As hypothesized, linear mixed model (LMM) analyses revealed that attentional bias at assessments (n=291 assessments) significantly declined over the week in the AR group, but there was no decline in the control group. After day 5, the AR group exhibited significantly lower attentional bias than the control group. AR also reduced craving ratings following briefly-presented pictures containing both smoking and non-smoking features presented on the PDA. AR may train smokers to attend to the non-smoking features of the picture and therefore reduce exposure to the smoking features and reduce craving. AR did not significantly influence self-reported smoking behavior or biochemical measures of smoke intake. The second study was a parallel group randomized controlled trial of a brief mindfulness meditation (Brief-MM) intervention delivered to smokers on a PDA. Adult community smokers (N = 44) were randomly assigned to a Brief-MM or Control (sham meditation training) group. All participants carried a PDA for two weeks and were instructed to initiate 20 minutes of meditation (or control) training on the PDA once per day and to complete an assessment of cognitive and affective processes immediately afterwards (meditation assessments, MAs). Additionally, they were prompted to complete RAs up to four times per day. They were instructed to smoke as much or as little as they liked during the study. Thirty-seven participants provided at least one EMA data point and completed in total 1874 assessments (RAs and MAs). The Brief-MM group completed 1134 assessments (mean = 56.7), and the control group completed 740 assessments (mean = 43.5). LMM analyses revealed that Brief-MM increased state, but not trait, mindfulness over time. LMMs also indicated that Brief-MM reduced cigarettes smoked per day over time more than the Control group, reduced craving post-meditation, and reduced negative affect. Brief-MM did not significantly influence attentional bias to smoking cues assessed using a visual probe task. In sum, the two studies reveal that it is feasible to administer a cognitive intervention, and to assess cognition, on a mobile device. Both studies revealed a significant effect of the intervention on craving. Using smartphones, it may be possible to track cognition in real-time. Ultimately, measures of cognition may be useful in the development of ecological momentary interventions for addiction.

Self-control strategies in daily life: A daily diary study about the interplay of situational factors, personality, and genetics on self-control success

---

Wenzel, M.[1] ; Kubiak, T.[1] ; Conner, T.S.[2]

[1] *Department of Health Psychology, University of Mainz, Mainz, Germany*
[2] *Department of Psychology, University of Otago, Dunedin, New Zealand*

Aims. In daily life, people are often confronted with temptations like a delicious cake in the bakery window or they are trying to avoid routinized behaviors like getting to bed too late. We explored the efficacy of strategies in

regulating temptations and habits in daily life and how this efficacy is moderated by situational factors, personality and genetics. Methods. 302 young adult participants (65% female, 19.9±2.3 years old) completed a combined laboratory and 13-day daily diary study. In the laboratory session, we assessed personality using the NEO-FFI and obtained blood samples to genotype variants associated with activity in the dopaminergic systems (COMT Val158Met, DRD4-521C/T, and DRD2-Taq1A). In the daily diary part, participants answered questions about their experiences trying to exert self-control that day, including the strategies used (monitoring, distraction, stimulus control, or doing nothing), their affective experiences preceding self-control strategies, perceived self-control success, and whether they experienced a strong or weak temptation or habit. Results. Situational factors. All three self-control strategies were more effective than doing nothing. For strong temptations, distraction was more effective, b = 0.081, p = .032, and monitoring was less effective, b = -0.067, p = .047. Moreover, the beneficial effect of distraction from strong temptations depended on affect, in that distraction was more effective when participants felt positive, b = 0.115, p = .033. Personality: We found personality differences in self-control success: Conscientiousness was positively associated, b = 0.309, p < .001, and neuroticism negatively, b = -0.180, p = .003. We also analyzed how the personality influenced the situational factors. Genetics: There were no genetic differences except for COMT: Men with the Val/Val polymorphism reported less self-control success than men with at least one Met allele or women in general, b = -0.101, p = .023. Conclusions. These results demonstrate that the efficacy of self-control strategies on self-control success in daily life is moderated by temptation strength and affect. Furthermore, they provide evidence for the influence of personality and genetics.

Psychiatric diagnosis revisited: Towards a system of staging and profiling combining nomothetic and iIdiographic parameters of momentary mental states

Wigman, J.T.W.[1] ; Van Os, J.[2] ; Thiery, E.[3] ; Derom, C.[4]

[1]*Department of Psychiatry & Psychology, Maastricht University, Maastricht, The Netherlands*
[2] *Department of Psychiatry and Psychology, Maastricht University Medical Centre, Maastricht, The Netherlands, Department of Psychosis Studies, King's College London, London, United Kingdom*
[3]*Department of Neurology, Ghent University Hospital, Ghent, Belgium*
[4]*Centre of Human Genetics, University Hospital Leuven, Leuven, Belgium. Dept of Human Genetics, KU Leuven, Leuven, Belgium*

Background Mental disorders may be reducible to sets of symptoms, connected through systems of causal relations. A clinical staging model predicts that in earlier stages of illness, symptom expression is both non-specific and diffuse. With illness progression, more specific syndromes emerge. This paper addressed the hypothesis that connection strength and connection variability between mental states differ in the hypothesized direction across different stages of psychopathology. Methods In a general population sample of female siblings (mostly twins), the Experience Sampling Method was used to collect repeated measures of three momentary mental states (positive affect, negative affect and paranoia). Staging was operationalized across four levels of increasing severity of psychopathology, based on the total score of the Symptom Check List. Multilevel random regression was used to calculate inter- and intra-mental state connection strength and connection variability over time by modelling each momentary mental state at t as a function of the three momentary states at t-1, and by examining moderation by SCL-severity. Results Mental states impacted dynamically on each other over time, in interaction with SCL-severity

groups. Thus, SCL-90 severity groups were characterized by progressively greater inter- and intra-symptom connection strength, and greater inter- and intra-symptom connection variability. Conclusion Diagnosis in psychiatry can be described as stages of growing dynamic causal impact of mental states over time. This system achieves a mode of psychiatric diagnosis that combines nomothetic group-based classification across stages) and idiographic (individual-specific psychopathological profiles) components of psychopathology at the level of momentary mental states impacting on each other over time.

Intrusions and physiological hyperarousal in daily life in patients with posttraumatic stress disorder

Wilhelm, F.H.[1] ; Pfaltz, M.C.[2] ; Grossman, P.[3] ; Blechert, J.[4] ; Meyer, A.H.[5] ; Michael, T.[6]

[1] *Department of Psychology, University of Salzburg, Salzburg, Austria*
[2] *Department of Psychology, Harvard University, Cambridge, USA*
[3] *Department of Psychosomatic Medicine, University of Basel, Basel, Switzerland*
[4] *Department of Psychology, University of Salzburg, Austria*
[5] *University of Basel, Basel, Switzerland*
[6] *Department of Clinical Psychology and Psychotherapy, University of Saarbrücken, Saarbrücken. Germany*

To date, systematic investigations of symptoms of posttraumatic stress disorder (PTSD) in daily life of PTSD patients, like intrusive recall of memories associated with a traumatic event or persistent hyperarousal, are widely lacking. Seventeen PTSD patients, 28 healthy controls (HC), and 24 panic disorder (PD) patients (clinical control group, reporting on recall of severe panic attacks, PAs) were examined psychophysiologically during a laboratory baseline and then completed electronic symptom diaries 36 times during one week while they were physiologically monitored with the LifeShirt system. In the lab, PTSD patients were characterized by physiological hyperarousal compared to PD and HC, as evidenced by elevated heart rate (HR) and electrodermal activity, and reduced respiratory sinus arrhythmia (RSA, a measure of vagal functioning). In daily life, HR was particularly elevated in PD patients and somewhat elevated in PTSD patients compared to HC.PTSD patients frequently reported re-experiencing symptoms (i.e., thoughts, memories, and reliving of their trauma) and symptoms of dissociation. However, compared to PD patients, PTSD patients reported more intrusive memories [incidence rate ratio (IRR) = 2.8]. Patient groups relived their trauma/PAs (i.e., they acted or felt as if the event was recurring) equally frequently, and reported comparable bodily reactions and distress associated with trauma/PA memories. Clinical groups avoided trauma/PA reminders more often than HC (avoidance of trauma/PA related thoughts: IRR = 8.0; avoidance of things associated with the trauma/PA: IRR = 40.7) and PD patients avoided trauma/PA reminders less often than PTSD patients (avoidance of trauma/PA related thoughts: IRR = 2.5; avoidance of things associated with the trauma/PA: IRR = 4.1). We conclude that intrusive re-experiencing symptoms in daily life are frequent in PTSD patients as well as PD patients. However, physiological hyperarousal is context dependent in both disorders, with PTSD patients showing increases particularly in the lab and PD patients showing increases particularly in daily life.

Are body and limb movements during sleep related to sleep quality?

Wilhelm, P.; Hoffmann, J.; Petrelli, D. ; Munsch, S.

Department of Psychology, University of Fribourg, Fribourg, Switzerland

During sleep motor activity is largely inhibited. Nevertheless, particular body movements, such as body turns from one side to the other or brief movements of the limbs occur at frequent intervals. Such movements can easily be assessed with accelerometers. Although the use of accelerometers is well established in sleep research the detailed investigation of body movements during sleep has not yet gained much attention. Research Questions Focusing on the nature of body movements during sleep we conducted three studies to answer the following questions: 1) How often do particular body movements occur during sleep? 2) Are body and limb movements related to sleep quality? 3) Is the anticipation of a stressful event the next day associated with an increase in body or limb movements during the previous night? Method In study 1 and 2 a total of 22 and 24 students participated in a 24 hours monitoring of physical activity and ECG. Accelerometers were fixed at the chest, the right hip and the limbs. After awakening participants reported bed, sleep and wake-up times and the quality of their sleep using a standardized sleep diary. Accelerometer data were visually inspected and different movement patterns identified (e.g. quarter turns of the chest- which correspond to a turn from the back to the left or right side; or half turns which correspond to a turn from one side to the other). In study 3, currently conducted to answer question 3, students who give a presentation in class – normally a stressful event – participate in a 48 hour monitoring of their physical activity. Movement activity during the night before the presentation will be compared to movement activity during the night following the presentation. Results Initial results are available from study 1: Participants slept 7 hours on average (SD = 1.06). During sleep they performed about 28 quarter- and 9 half turns of the chest, resulting in a total of 37 chest turns, however, individual differences were large (SD = 32). Neither the amount of chest turns nor the average movement activity measured at the chest was correlated with sleep quality. Sleep quality was poorer the more activity was measured at the leg (r- .49, $p < .05$), or the arms ($r < -.32$, however due to the small sample size these latter correlations were not significant). We aim to replicate these findings with data gathered in study 2. In addition, we will analyze movement activity the night before and after a stressful event based on data gathered in study 3. Conclusions Body movements during sleep occur frequently, and vary widely. A better quality of sleep seems to be associated with reduced limb movements during sleep, but not with reduced movements of the upper part of the body. These results are preliminary; however, the data available before the conference should allow stronger conclusions.

Snackimpuls: a smartphone application to study snacking behaviour in daily life

Wouters, S.G.M.; Thewissen, V.; Lechner, L. ; Jacobs, N.E.

Faculty of Psychology, Open University of the Netherlands, Heerlen, The Netherlands

Introduction: Worldwide the number of people with overweight has increased substantially over the years and it is expected that this trend continues to rise. Overweight is associated with the most important burdens of disease, such as cardiovascular diseases, type 2 diabetes and cancer. There is mounting evidence that unhealthy food choices,

especially between-meal snacks, contribute significantly to overweight. Research investigating determinants of unhealthy eating behaviour has mainly focussed on explicit determinants such as cognition or self-efficacy. However, recent research suggests that particularly implicit determinants such as fleeting emotions and self-esteem are crucial in predicting unhealthy eating. Traditional questionnaires fall short to grasp these daily life dynamic psychological processes. Objectives: The smartphone application Snackimpuls was specifically developed to gain insight into the implicit determinants of between-meal snacking and their dynamic interplay in daily life. Between-meal snacking was defined as consumption of food or beverages, excluding main meals. The focus on between-meal snacking is based on the hypothesis that snacking can be considered as a way of dealing with daily changes in emotions, stress and self-esteem. A pilot study was conducted to examine the feasibility and reliability of Snackimpuls. Methods: Snackimpuls is based on the Experience Sampling Method, a validated structured self-assessment diary method, and was used to collect multiple assessments (10 times a day for 7 consecutive days) of current emotions (positive affect, negative affect and agitation), self-esteem, situational and social context and between-meal snack intake. To report between-meal snack intake Snackimpuls has a built-in search function which allows participants to easily report their snacks. This search function consults a composition nutrient table based on a scientifically accepted Dutch food composition database (NEVO online version 2011/3.0). In the underlying database, which is not visible to the participant, the reported snack intake is automatically converted into kilocalories, protein, fats and carbohydrates. In addition, a demonstration tool was integrated in Snackimpuls to allow participants to gain experience with the Snackimpuls application before the start of the study. Snackimpuls is a novelty within the spectrum of Experience Sampling tools. As the internet and other ICT applications have become increasingly intertwined with everyday life, this medium lends itself well for research purposes. Findings: The pilot sample consisted of 8 women and 4 men from the general population. Mean age was 43,6 years (SD: 10.9, range: 25-60). The multiple assessment approach resulted in 584 valid observations which is 69,5% of the maximum number of beeps. Emotions and self-esteem were assessed using a 7-point Likert scale. The mean score of positive affect (5.33; SD: 0.71), negative affect (1.23; SD: 0.28), agitation (2.13; SD: 0.69) and self-esteem (6.14; SD: 0.55) is consistent with previous studies. The reliability coefficients of these constructs, which ranged from good to very good (Cronbach's a between 0.79 and 0.94), are also in accordance with previous research. If respondents snacked, they consumed on average 172 Kcal per beep. Respondents considered Snackimpuls (very) user-friendly (82%). Conclusions: This pilot study suggests feasibility and reliability of the Snackimpuls smartphone application to assess implicit momentary psychological processes in the realm of daily life. Snackimpuls is currently used in a large-scale study investigating implicit determinants of between-meal snacking in a general population sample. Results of this study will be used for the development of a smartphone intervention to promote change to and maintenance of healthy eating behaviour.