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Mental energy in various irrational thinking process: How a quantitative approach can help in modifying Behavior

Luisetto M, Almukthar Naseer, Farhan Ahmad Khan, Mashori Gulam Rasool, Fiazza C, Yesvi A Rafa, Ilnaf Ilman and Oleg Yurevich Latischev

Abstract
Observing REBT discipline it ispossible to verify that some irrational mental process produce Various level of behavioral problems. Because every human cognitive task require and use a determinate quantum of " mental energy"Used in translating emotion in behavior. It is interesting to focus the attention on the global management of this system. For the scope of this work Mental Energy is not involved in any caloric value, but a quantic system of level of mental effort for various cognitive or emotional task. Related the literature analysed it is clear that all unfunctional mental process (Mindset kinetics) Produce and umbalance in long term with relevant behavior implication in variuos settings (Socila, individual, working, family). In this work the topic is analized using a multidisciplinar poin of view, psycological, neuroscience, management and other useful.

Keywords: mental energy, brain, mind, mindset kinetics, irrational process, REBT, HR management, quantitative, measure

Introduction
This work aim to analize the preblem related the mind energy kinetics and its malfuntions due by some condition.
For this scope the term mind energy has not a connotation of caloric measure but a measure of mental effort that the various midn activity is required an used.
An overload of mental work or abnormal irrational thinking process related emotional translation can produce unbalance in this complex system.
External stimuli, emotions registered and elaborated by brain- mind complex cna results in an inefficient behavior for today society.

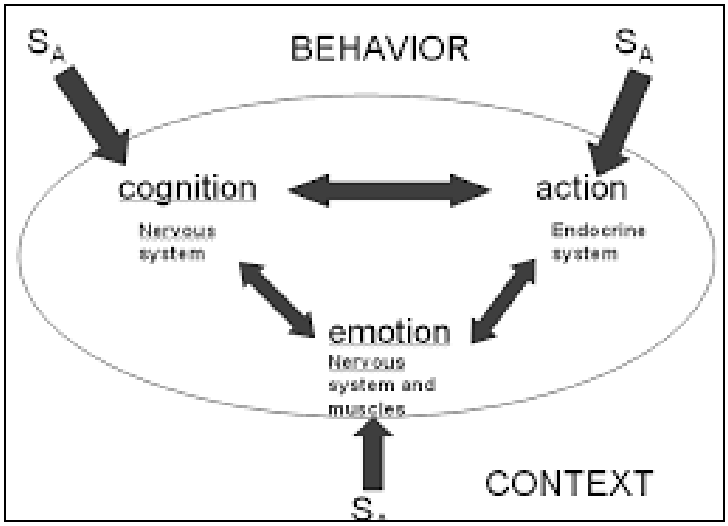

Fig 1a: Emotion and Rationality: A Critical Review and Interpretation of Empirical Evidence Michel Tuan Pham June 1, 2007 Research Article https://doi.org/10.1037/1089-2680.11.2.155

"The relation between emotion and rationality is assessed by reviewing empirical findings from multiple disciplines. Two types of emotional phenomena are examined—incidental emotional states and integral emotional responses—and three conceptions of rationality are considered—logical, material, and ecological. Emotional states influence reasoning processes, are often misattributed to focal objects, distort beliefs in an assimilative fashion, disrupt self-control when intensely negative, but do not necessarily increase risk-taking. Integral emotional responses are often used as proxies for values, and valuations based on these responses exhibit distinct properties: efficiency, consistency, polarization, myopia, scale- insensitivity, and reference-dependence. Emotions seem to promote social and moral behavior"

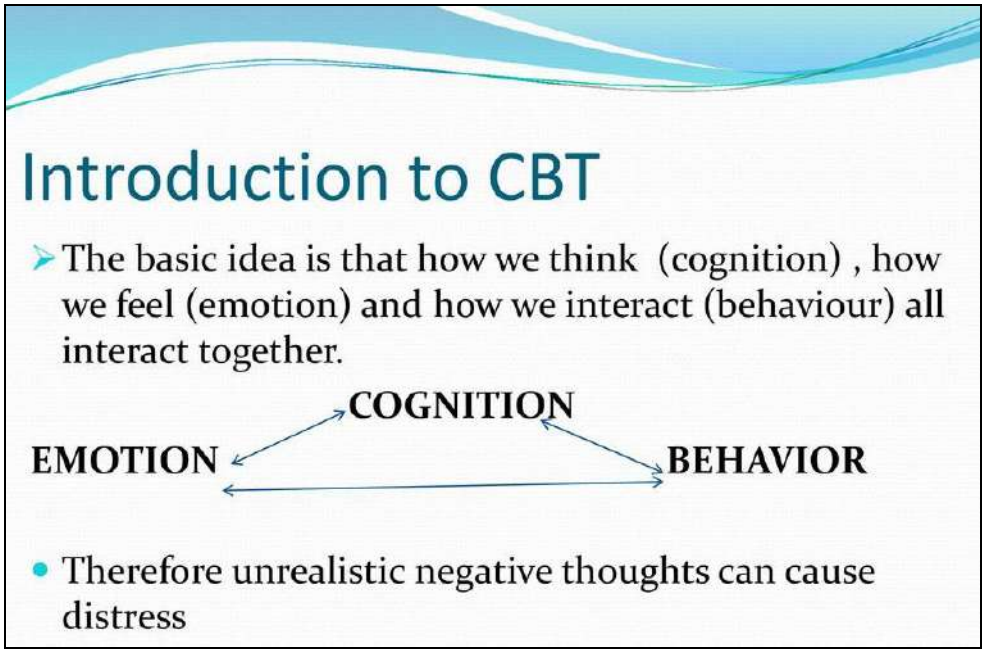

Fig 1b: By M. Garrett

Hum Brain Mapp. 2022 Feb 15; 43(3): 1011–1031.2021 Nov 5. doi: 10.1002/hbm.25703
Facing successfully high mental workload and stressors: An fMRI study
Mickaël Causse, Evelyne Lepron, Kevin Mandrick, Vsevolod Peysakhovich, Isabelle Berry, Daniel Callan, and Florence Rémy
"A fine-grained understanding of how the brain copes with an important mental workload or a stressful situation is a major issue to promote human performance in a challenging environment. Complex and safety-critical activities, such as piloting an airplane or operating a nuclear power plant, can lead to a drastic and simultaneous increase of both mental workload and acute stress".

Opinion article
Front. Psychol., 16 February 2022| https://doi.org/10.3389/fpsyg.2022.742557
Emotion Regulation, Effort and Fatigue: Complex Issues Worth Investigating
Karol Lewczuk, Magdalena Wizła, Tomasz Oleksy and Mirosław Wyczesany
"Emotion regulation (ER) refers to the processes by which individuals can influence the type of emotions they have, for how long as well as how strongly they experience and express them. ER is not simply constrained to diminishing negative emotions, but can include up- as well as down-regulation of both positive and negative emotional states, depending on one's regulatory aims. Moreover, emotion regulation can happen both on an individual level, as well as in a group context, and on a conscious and deliberate, as well as an automatic level. ER requires significant effort to be exerted, which can affect its efficiency. This is especially the case for explicit and intentional ER of one's emotion (which is the focus of the current work) as automatic and implicit ER can potentially be applied with no significant effort. Investigating if and how ER effectiveness can diminish as a result of investing effort and the resulting fatigue is crucially important, as in daily life people are often put in circumstances that routinely require prolonged, incessant or recurring engagement in ER during work, education and self-regulated learning as well as social interactions"

Ind Psychiatry J. 2010 Jan-Jun; 19(1): 37–40.
doi: 10.4103/0972-6748.77634
PMCID: PMC3105556
PMID: 21694789
Development of emotional stability scale
M. Chaturvedi and R. Chander1

"Thorndike and Hagenconsider that emotional stability of a person is characterized by evenness of moods, intent, interests, optimism, cheerfulness, composure, feeling of being in good health, freedom from feeling of guilt, worry or loneliness, freedom from day dreaming, freedom from perseveration of ideas and moods.
Smithson has viewed emotional stability as a multi-trait non-cognitive psychological concept. He defines emotional stability as 'a process in which personality is continuously striving for greater sense of emotional health both intra-psychically and intra-personality. Emotional stability enables the person to develop an integrated and balanced way of perceiving the problems of life. This organizational

ability and structured perception helps one to develop reality-oriented thinking, judgment and evaluation ability. One develops feelings, perceptions and attitudes that help in understanding the realities of life and conditions and circumstances that create miserable situations in life. Such understanding helps one promote high ego strength.

The study was conducted in three phases. Based on the concept of emotional stability as defined in the literature, 250 items were developed covering initially the following 6 dimensions of emotional stability:

The items were given to the judges, who were qualified psychologists with minimum 10 years of experience in the field of personality assessment. Out of these, 90 items were such where the judges could not reach a consensus, therefore these items were eliminated and only 160 items were retained for the initial trial. Besides this, the judges felt that there was an overlapping of items in the last two subscales i.e. emotions vs. logic and apathy vs. empathy. Hence the items of these subscales were merged together and the scale had only 5 dimensions.

Pessimism vs. optimism

Pessimists are gloomy and depressed, disappointed with their existence and at odds with the world. They have low self-esteem, are introverts, have feelings of guilt, interpersonal dependency, and remain passive in social situations.

On the other hand optimists are generally cheerful and positive in their outlook. They are satisfied with themselves, find life rewarding, and are at peace with the world. They show persistence in seeking goals in spite of setbacks and obstacles, operating from the hope of success rather than fear of failure. They perceive failures as being due to manageable circumstances rather than a personal flaw.

Example: Do you seem to have more than your share of bad luck?.

Apathy vs. empathy

People who are apathetic are detached, shrewd, worldly and expedient and harbor self- interest in their dealings with other people.

Empathy is an ability to feel for other people. People who are empathic in nature consider other's feelings along with related factors in the process of making intelligent decisions. They are warmhearted, trusting, straightforward and altruistic.

Example: Does it worry you if someone is annoyed with you for a mistake, which you have actually not committed?

Dependence vs. autonomy

The dependent person lacks self-reliance, thinks of himself as a helpless pawn of fate, is pushed around by other people and events and shows a high degree of authoritarian submission (the unquestioning obedience to institutional power).

The persons high on autonomy enjoy a great deal of freedom and independence, make their own decisions, view themselves as a master of their own fate and take realistic actions to solve their own problems.

Example: Do you place your trust in supernatural powers such as God or fate to see you through safely?

Anxiety vs calm

Anxious persons are easily upset by things that go wrong and are inclined to worry unreasonably about things that may or may not happen. Such people account for a high consumption of liquor or other narcotic agents.

People who are calm are placid, serene and resistant to irrational fears and anxieties. Because of this ability they can stay calm under pressure. They can also think clearly and stay focused.

Example: Do you often feel restless as though you want something but do not really know what?

Aggression vs. tolerance

Aggressive individuals are given to the direct or indirect expression of anger, for example, behavior such as temper tantrums, fighting, violent arguments and sarcasm, or participation in adventurous activities like mountaineering, car rallies etc. They take no nonsense from anyone and feel compelled to return fire or get back at anyone who transgresses against them.

Tolerant individuals are gentle, even tempered, with no personal conflicts and are not given to violence either direct or indirect. They efficiently manage their disruptive emotions and impulses.

Construct validity of the scale was measured in terms of inter-correlation between subscales of Emotional Stability Scale and total scale. Correlation matrix in Table 1 reveals that the inter-correlation among various subscales ranged from. 135 between aggression vs. tolerance and apathy vs. empathy to. 503 between dependence vs. autonomy and pessimism vs. optimism. All the correlations were found to be significant at P<.01 and above. All the subscales showed significantly positive correlation with the total score on the test ranging from. 33 (aggression vs. tolerance) to. 63 (anxiety vs. calm)."

Review article

Front. Neurosci., 07 April 2020 | https://doi.org/10.3389/fnins.2020.00268

A Neuroergonomics Approach to Mental Workload, Engagement and Human Performance

Frédéric Dehais, Alex Lafont, Raphaëlle Roy and Stephen Fairclough

Mental workload measurement

Research into the measurement of mental workload has outstripped the development of theoretical frameworks. Measures of mental workload can be categorized as performance-based, or linked to the process of subjective self-assessment, or associated with psychophysiology or neurophysiology."

Indicator	Methodology	Main results	Examples of research and additional comments
Subjective declaration of fatigue and/or effort invested in emotion regulation	Self-report	Self-report measures include, for example, single items, regarding the invested effort, asked after the task, for example: *How much effort did you invest to manage your emotions during this social interaction?* (answers given on a scale from 1 [*little effort*] to 5 [*a lot of effort*]). The main flaw of this index is its retrospective character and lack of possibility of tracking the dynamics during the ER task. Self-report measures are also used in ecological momentary assessment as, for example, retrospective measures at the end of the day; they have proven to enable the detection and evaluation of ER abnormalities in clinical populations.	Wong et al., 2017; Visser et al., 2018
Stimulus proceeding negativity	Electroencephalography (EEG, evoked potentials)	Event-related potential (ERP) is the brain's electrophysiological response to a stimulus. The amplification or attenuation of specific ERPs can be indicative of the amount of effort employed in ER. For example, stimulus preceding negativity is an ERP marker of self-control and its amplification can be used to determine whether self-referential emotional reactivity reduction employed effort. On the other hand, another ERP—the late positive potential has been consistently shown to decrease when effortful ER strategy was employed.	Moser et al., 2017
Pupil dilation	Pupillometry	Changes in pupil dilation are the involuntary signs of the autonomic nervous system's response. They reflect both cognitive effort, as well as emotional arousal. Pupil dilation is a reliable source of information about ER effortfulness and can distinguish between specific emotion regulation strategies in terms of their effortfulness. It was also proven useful in differentiating in the extent of cognitive effort employed in ER across different group ages. Also, pupil dilation decreasing with time can indicate the habituation process.	Strauss et al., 2016; Martins et al., 2018; Langer et al., 2021; Scheffel et al., 2021
Activity of specific brain regions	Functional magnetic resonance imaging (fMRI)	Effortful ER has been consistently linked to the activity of prefrontal-parietal structures associated with cognitive control. The most commonly reported structures are the ventrolateral and dorsolateral prefrontal cortex. Effortful ER also involves the dorsomedial prefrontal cortex and posterior parietal cortex, anterior cingulate cortex and inferior parietal cortex. Researchers also highlight the importance of amygdala-frontal functional connectivity in ER (studied in the resting-state paradigm). fMRI allows clinical populations to be distinguished from healthy controls, however, further examination is needed, for example, to disentangle the differences in neural activity for different ER strategies.	Banks et al., 2007; Dörfel et al., 2014; McLaughlin et al., 2015; Xie et al., 2016; Moser et al., 2017; Zhang et al., 2020. For a meta-analysis of research on brain activity during cognitive reappraisal, see: Buhle et al., 2014
	Functional near-infrared spectroscopy (fNIRS)	This methodology allows for studying the changes in the concentration of oxygenated hemoglobin (O2Hb) and deoxygenated hemoglobin are detected with the aid of near-infrared rays. The increase in (O2Hb) in specific brain regions is an indicator of energy consumption and reflects the greater effort. This increased energy consumption in specific brain regions. fNIRS has been, for example, used in studies distinguishing between effort exerted in surface and deep acting or to check whether effort invested in ER is dependent on context.	Lu et al., 2019; Azhari et al., 2020
Heart rate	Electrocardiography (ECG)	Increased heart rate reflects a greater autonomic response and was used as an indicator of greater effort and differentiated between reappraisal and acceptance strategies; reappraisal was more effective, but also more effortful yielding a greater autonomic response.	Goldin et al., 2019
Heart rate variability (HRV)	Electrocardiography (ECG)	Heart rate variability is the indicator of the variability of the duration of the periods between consecutive heartbeats. Increased HRV was proven to reflect decreased cardiovascular effort. After ER training the ER task elicited increased HRV. HRV was also used as a measure of ER effectiveness itself, and not its effortfulness. Disentangling physiological changes that happen as a result of emotional arousal (indicating ER failure) vs. as a result of effort exerted in ER can be difficult. Therefore, aside from using indicators of effort like HRV and skin conductance (see below), it is still reasonable to use sheer changes in ER efficiency over time as an indicator of fatigue and effortful exertion of self-regulation processes (following mental fatigue research) as well as a multitude of sources (multiple indicators) to gather full information about effort and fatigue involved in ER processes.	Christou-Champi et al., 2015 For HRV as a measure of ER effectiveness see also: Denson et al., 2011
Pre-ejection period (PEP)	Electrocardiography (ECG)	The pre-ejection period is defined as the period between the onset of left ventricular contraction and aortic valve opening and reflects the response of the sympathetic nervous system. Greater task engagement (due to e.g., its difficulty) was associated with a greater sympathetic response which was reflected by a proportional shortening of PEP. On the contrary, better ER regulation abilities were linked to PEP lengthening.	Gendolla and Silvestrini, 2010; Kahle et al., 2016
Skin conductance level (SCL)	Electrodermal activity (EDA)	Skin conductance level informs about the activity of sweat glands at the surface of the skin. Increased SCL indicates increased arousal that may reflect greater physical or psychological effort invested in ER. Differences in SCL between people of different cultural backgrounds may suggest differences in cognitive and psychological effort invested in the suppression of emotions; skin conductance levels may be treated as an indicator of ER effortfulness.	Soto et al., 2016 Just as HRV, skin conductance level was also used as a measure of ER effectiveness, rather than effort: Opitz et al., 2014

Fig 2: Indicators of emotion regulation effort (other than changes in sheer ER effectiveness) in available studies—examples of use. From Karol Lewczuk *et al*.

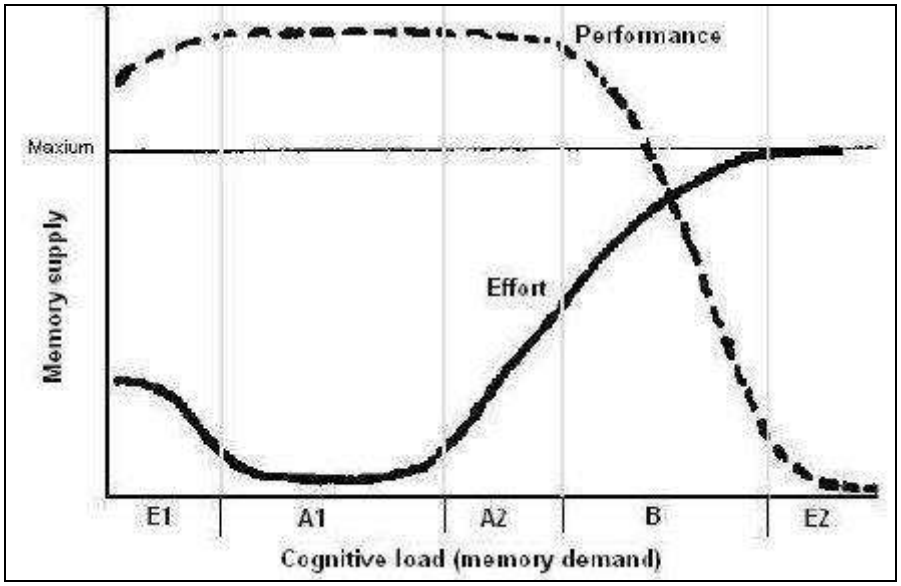

Fig 3: Model of user performance, mental effort and cognitive load from DOI: 10.1145/1151903.1151933

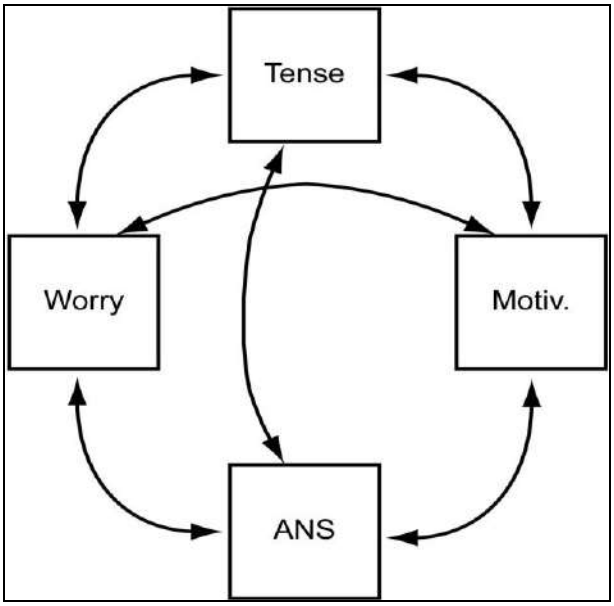

Fig 4: A schematic network model for the emotion of anxiety.from ORIGINAL RESEARCH article

Front. Psychol., 30 April 2020 | https://doi.org/10.3389/fpsyg.2020.00742
All Happy Emotions Are Alike but Every Unhappy Emotion Is Unhappy in Its Own Way: A Network Perspective to Academic Emotions
Markus Mattsson*, Telle Hailikari and Anna Parpala

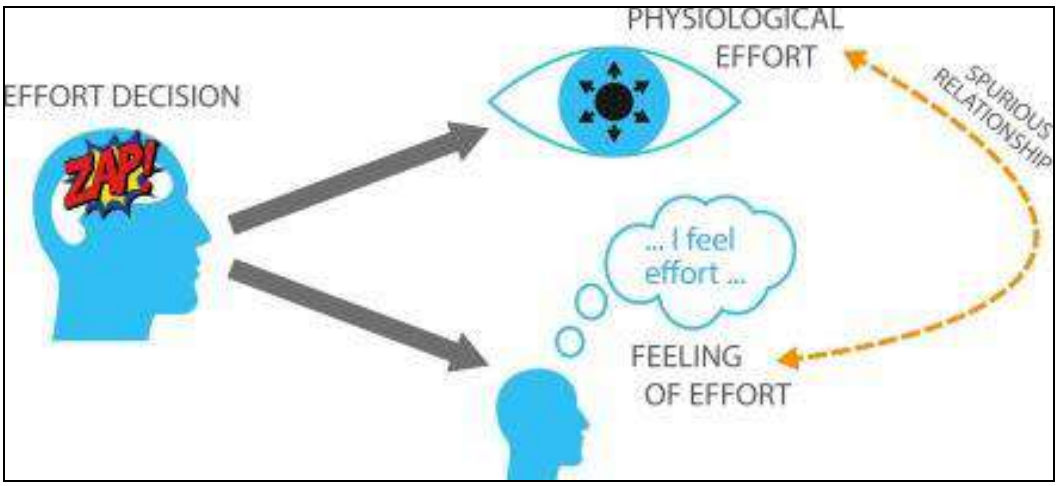

Fig 5: From Front. Psychol., 30 April 2020 | https://doi.org/10.3389/fpsyg.2020.00742

Consciousness and Cognition
Volume 63, August 2018, Pages 218-227
Consciousness and Cognition

The feeling of effort during mental activity
Author links open overlay panelErikBijleveld
https://doi.org/10.1016/j.concog.2018.05.013

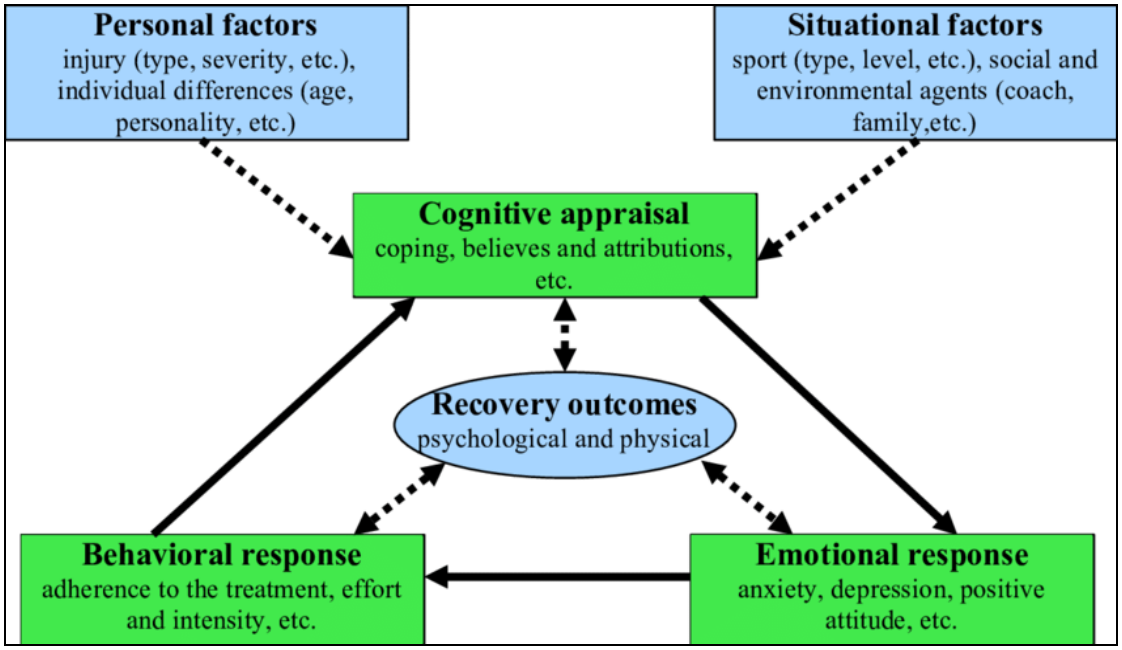

Fig 6: from DOI: 10.4100/jhse.2013.84.13

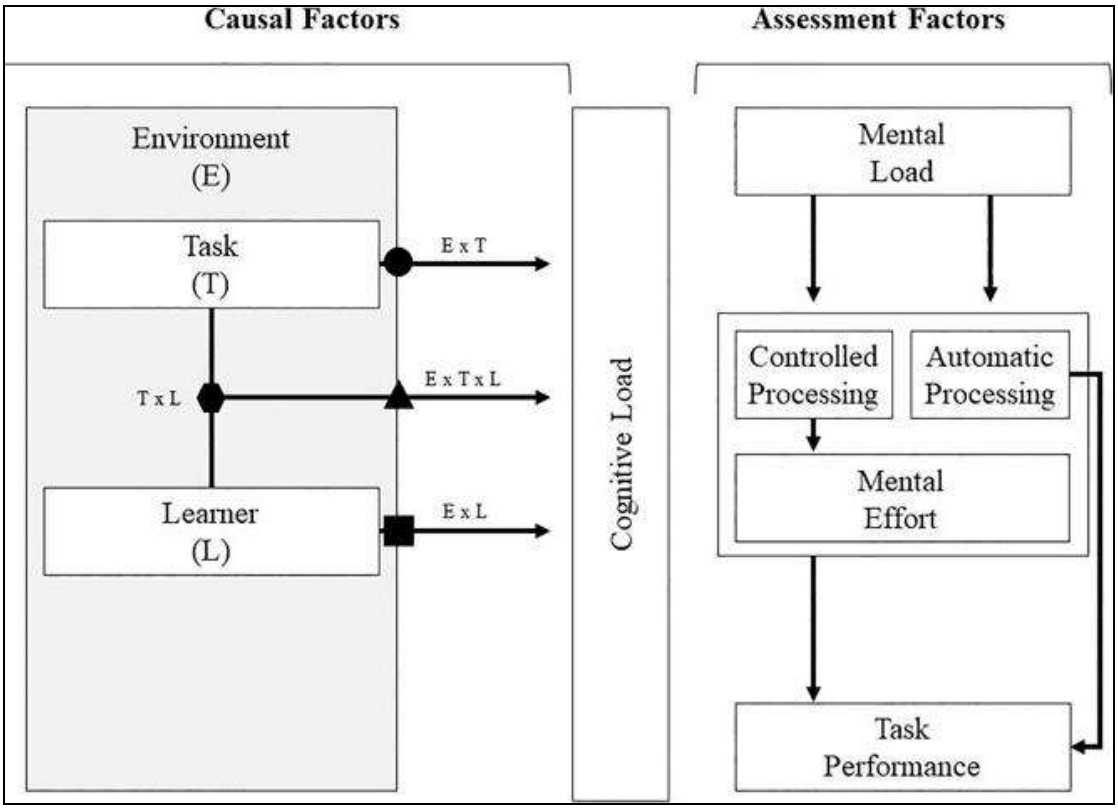

Fig 7: from https://doi.org/10.3389/feduc.2021.632907 FromChristian Korunka, Sara Tement (University of Vienna) Cristina Zdrehus, Adriana Borza (University of Oradea)

What is burnout?

"The "burn-out" metaphor implies not only that somebody had to be "burning" (i.e. is strongly liked his/her job, was strongly committed, etc.) before he or she would be able to "burn-out", but also that once a fire is burning, it cannot continue to burn unless resources are provided to keep it on burning. In other words, employees' energy or capacity to work can diminish over time when the work environment does not provide resources and is especially demanding. In a terminal stage a state of physical, emotional and mental exhaustion will occur from which it is hard to recover. There is another metaphorical meaning of burnout: Somebody could only burn out if he or she was "burning" before. Thus, engagement, enthusiasm and interest in

someone's job are a necessary precursor of burnout."

Material and Methods

Whit an observational point of view some relevant literature is analyszed and an experimental hypotesys is submitted in order to produce a global conclusion.

Figures reported help to show the concept involved.

All literature comes frome biomedical databases

Results

From literature

Varius Emotional Task Require Different Energy Consuption

Review Nutr Neurosci. Oct-Dec 2007; doi: 10.1080/10284150701722273.

Cognitive methods for assessing mental energy

Harris R Lieberman

DOI: 10.1080/10284150701722273

"Mental energy is not well defined but of considerable public interest. Although the physical energy required to complete a task can be objectively specified, the concept of mental energy is relatively new. Mental energy is a mood, but can also be defined as ability or willingness to engage in cognitive work. This review addresses the concept of mental energy and cognitive tests used to assess it. Methods that can be used to assess mental energy, including tests of cognitive performance, mood questionnaires, electrophysiological techniques, brain scanning technologies, and ambulatory monitoring, are discussed. Studies of the factors affecting mental energy, such as drugs, foods, sleep deprivation, and disease states, are also reviewed. In aggregate, the studies reviewed suggest use of cognitive tests that assess vigilance, ability to sustain attention, and choice reaction time are optimal for assessment of mental energy. Specific tests recommended include the psychomotor vigilance task, Wilkinson four-choice visual reaction time, the scanning visual vigilance test, and Wilkinson auditory vigilance test. These tests are sensitive to factors that both increase and decrease mental energy [1]."

Front Neurosci. 2019 Dec 5;13:1292. doi: 10.3389/fnins.2019.01292. eCollection 2019.

Mental Effort and Information-Processing Costs Are Inversely Related to Global Brain Free Energy During Visual Categorization

Logan T Trujillo

DOI: 10.3389/fnins.2019.01292

"Mental effort is a neurocognitive process that reflects the controlled expenditure of psychological information-processing resources during perception, cognition, and action. There is a practical need to operationalize and measure mental effort in order to minimize detrimental effects of mental fatigue on real-world human performance. Previous research has identified several neurocognitive indices of mental effort, but these indices are indirect measures that are also sensitive to experimental demands or general factors such as sympathetic arousal. The present study investigated a potential direct neurocognitive index of mental effort based in theories where bounded rational decision makers (realized as embodied brains) are modeled as generalized thermodynamic systems. This index is called free energy, an information-theoretic system property of the brain that reflects the difference between the brain's current and predicted states. Theory predicts that task-related differences in a decision makers' free energy are inversely related to information-processing costs related to task decisions. The present study tested this prediction by quantifying global brain free energy from electroencephalographic (EEG) measures of human brain function. EEG signals were recorded while participants engaged in two visual categorization tasks in which categorization decisions resulted from the allocation of different levels of mental information processing resources. A novel method was developed to quantify brain free energy from machine learning classification of EEG trials. Participant information-processing resource costs were estimated via computational analysis of behavior, whereas the subjective expression of mental effort was estimated via participant ratings of mental workload. Following theoretical predictions, task-related differences in brain free energy negatively correlated with increased allocation of information-processing resource costs. These brain free energy differences were smaller for the visual categorization task that required a greater versus lesser allocation of information-processing resources. Ratings of mental workload were positively correlated with information-processing resource costs, and negatively correlated with global brain free energy differences, only for the categorization task requiring the larger amount of information-processing resource costs. These findings support theoretical thermodynamic approaches to decision making and provide the first empirical evidence of a relationship between mental effort, brain free energy, and neurocognitive information-processing. The present study investigated a system property of the brain called free energy that in theory is directly sensitive to the information-processing resource costs allocated through mental effort. The concept of free energy originated in thermodynamic physics where it is a measure of the work (or useful energy) a physical system can exert after accounting for internal energy losses due to heat. Brain free energy is an information-theoretic generalization of this concept that reflects the brain's surprise – the difference between the brain's current and predicted states ; see Figure 1. In this context, free energy acts as a motivating influence for the brain in that the latter seeks to minimize its free energy (and thus its surprise) in order to maintain physiological homeostasis (see section "The Free Energy Principle (FEP) for the Brain"). The minimization of the brain's free energy corresponds to a process of approximate Bayesian inference that has important consequences for perception, cognition, and action. The process of brain free energy minimization has been termed the FEP [2]. "

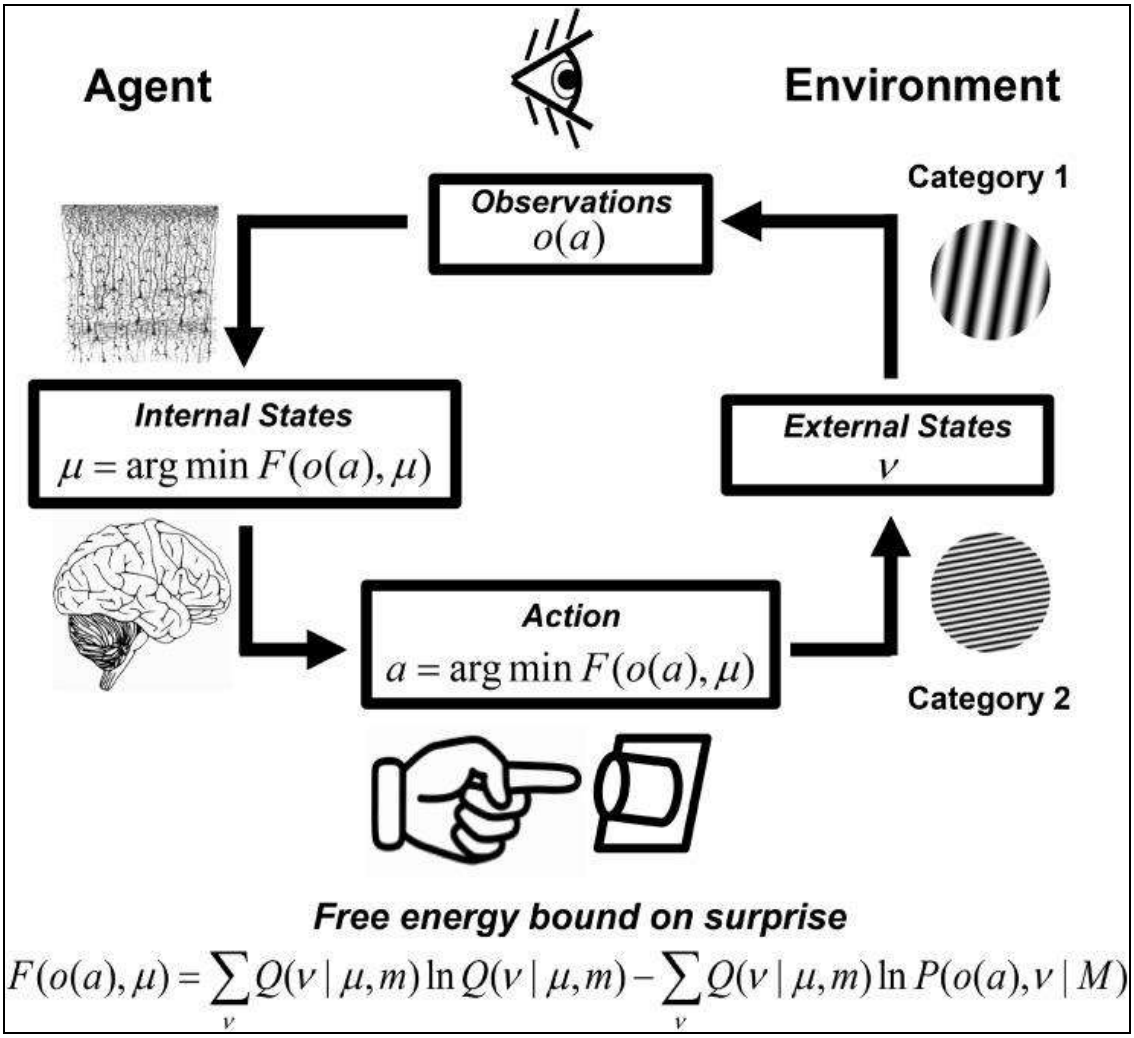

Fig 7: Approximate Bayesian-inference and free energy minimization in visual categorization.

External world states ν encompass hidden causes of observations o. Observations may also be influenced by actions a, which change external world states and resultant observations. Brain free energy and surprise is minimized when (1) the brain, parameterized by internal neural states μ, approximately predicts the causes of observations according to a model m that partially-encodes an optimal model of the world M, or (2) when the brain's actions change external world states and resultant observations to be in accordance with predictions based on a sub-optimal world model m encoded by the brain. For a detailed explanation, see Supplementary Material: The Free Energy Principle (FEP) for the Brain. Neural tissue slice figure element from Comparative Study of the Sensory Areas of the Human Cortex (p. 363) by S. Ramón y Cajal, 1899, Worcester, MA, United States: Clark University (Ramón y Cajal, 1899). Image is in public domain. Brain image (no title, author unknown), uploaded July 8, 2014, retrieved January 15, 2019 from https://pixabay.com/vectors/brain-intelligence-science-mind-312007/. Image is in the public domain via a CC0 license. FROM Logan T. Trujillo*
Front Psychol. 2021 Aug 20;12:717414. doi: 10.3389/fpsyg.2021.717414. eCollection 2021.

Deriving Mental Energy From Task Completion
Xiang Wang, Chris Janiszewski, Yanmei Zheng, Juliano Laran, Wonseok Eric Jang
DOI: 10.3389/fpsyg.2021.717414
"Many tasks in everyday life (e.g., making an accurate decision, completing job tasks, and searching for product information) are extrinsically motivated (i.e., the task is performed to gain a benefit) and require mental effort. Prior research shows that the cognitive resources needed to perform an extrinsically motivated task are allocated pre-task. The pre-task allocation of mental resources tends to be conservative, because mental effort is costly. Consequently, there are mental energy deficits when the use of mental resources exceeds the allocated amount. This research provides evidence for post-task mental energy replenishment. The amount of resource replenishment is a function of the size of the mental energy deficit and the favorability of the cost-benefit trade-off experienced at the completion of the task (i.e., the value of the reward given the energy investment). The findings have implications for how cognitive resources management influences the availability of mental energy on a moment-to-moment basis [3]."

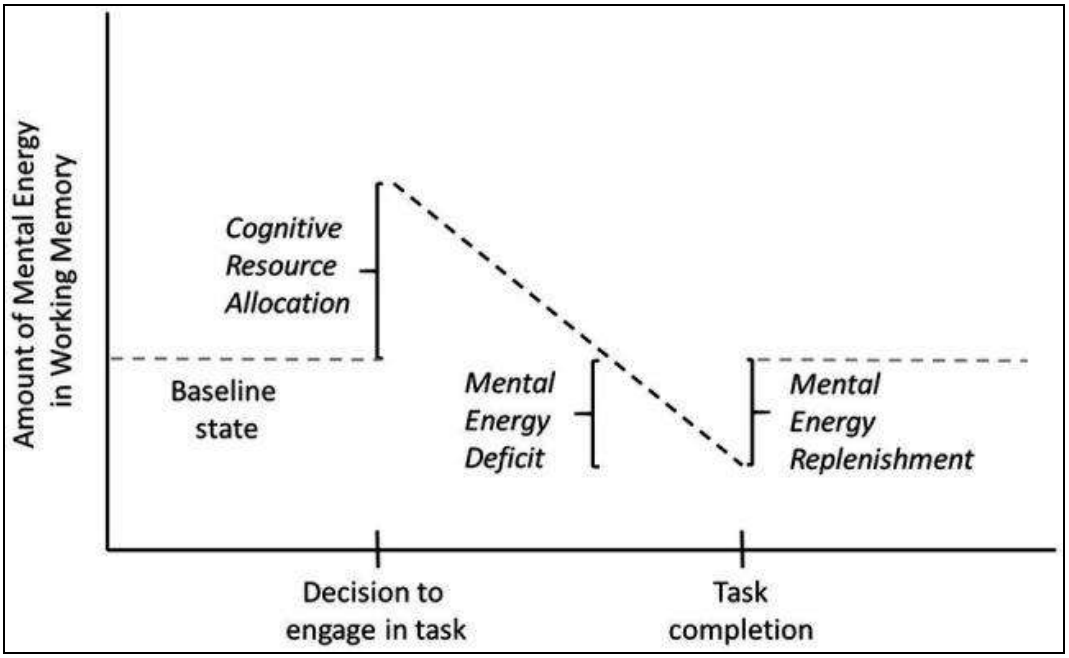

Fig 8: Illustration of cognitive resource allocation, a mental energy deficit, and replenishment.

The baseline level of mental energy is shown by the gray dashed line. The decision to engage in a task increases the level of mental energy (cognitive resource allocation). The amount of mental energy used during the completion of a task can be more than was allocated (mental energy deficit). Task completion provides an opportunity for mental energy replenishment. From Xiang Wang *et al*.

APA PsycArticles

Edwards, Elizabeth J. Edwards, Mark S. Lyvers, Michael (2015). Cognitive trait anxiety, situational stress, and mental effort predict shifting efficiency: Implications for attentional control theory. Emotion, 15(3), 350–359. https://doi.org/10.1037/emo0000051

"Attentional control theory (ACT) predicts that trait anxiety and situational stress interact to impair performance on tasks that involve attentional shifting. The theory suggests that anxious individuals recruit additional effort to prevent shortfalls in performance effectiveness (accuracy), with deficits becoming evident in processing efficiency (the relationship between accuracy and time taken to perform the task). These assumptions, however, have not been systematically tested. The relationship between cognitive trait anxiety, situational stress, and mental effort in a shifting task (Wisconsin Card Sorting Task) was investigated in 90 participants. Cognitive trait anxiety was operationalized using questionnaire scores, situational stress was manipulated through ego threat instructions, and mental effort was measured using a visual analogue scale. Dependent variables were performance effectiveness (an inverse proportion of perseverative errors) and processing efficiency (an inverse proportion of perseverative errors divided by response time on perseverative error trials). The predictors were not associated with performance effectiveness; however, we observed a significant 3-way interaction on processing efficiency. At higher mental effort (+1 SD), higher cognitive trait anxiety was associated with poorer efficiency independently of situational stress, whereas at lower effort (–1 SD), this relationship was highly significant and most pronounced for those in the high-stress condition. These results are important because they provide the first systematic test of the relationship between trait anxiety, situational stress, and mental effort on shifting performance. The data are also consistent with the notion that effort moderates the relationship between anxiety and shifting efficiency, but not effectiveness. (PsycINFO Database Record (c) 2016 APA, all rights reserved) "(4)

Ergonomics. 1993 Sep;36(9):991-1005. doi: 10.1080/00140139308967972.

Comparing the concepts of mental load and stress

A W Gaillard

DOI: 10.1080/00140139308967972

"This paper delineates mental load and stress as two related concepts that originate from different theoretical

frameworks. A proper distinction between the two concepts is important, not only for theory building, but because it may lead also to different interpretations of experimental results, and, consequently, to different recommendations in applied situations. High workload is regarded as an important but not a critical factor in the development of stress symptoms. It is quite possible to work hard in difficult and complex tasks, even under unfavourable conditions, without cognitive strain, psychosomatic complaints, or adverse physiological effects. High task demands can be met by mobilizing extra energy through mental effort. This 'trying harder' reaction is a normal and healthy coping strategy to adapt to situational demands. In contrast, stress is regarded as a state in which the equilibrium between cognitive and energetical processes is disturbed by ineffective energy mobilization and negative emotions. Stress typically is characterized by inefficient behaviour, overreactivity, and the incapacity to recover from work. Stress is regarded as a state in which the physiological system is disorganized, which results in decreased well-being, sleeping problems, psychosomatic complaints, and increased health risks [5]."

Psychology, Social Sciences and Humanities

Emotions correlate with perceived mental effort and concentration disruption in adult sport performers

Mark S. Allen,Marc Jones,Paul J. McCarthy,Sam Sheehan-Mansfield &David Sheffield 20 Feb 2013

https://doi.org/10.1080/17461391.2013.771381

"Two studies explored the relationship between emotions, perceived mental effort and concentration disruption in adult sport performers. In Study 1, semi-professional association football players completed questionnaire measures before and after a competitive match. In Study 2, student athletes completed questionnaire measures for two performance scenarios: one in which they were performing above their normal level and one in which they were performing below their normal level. Findings demonstrated that cognitive trait anxiety was associated with greater disruptions in concentration but was unrelated to mental effort. For state measures, athletes reported greater levels of concentration disruption when experiencing high levels of anxiety or high levels of happiness, and fewer disruptions in concentration when experiencing high levels of excitement. Findings also showed that excitement was associated with low levels of mental effort during good performances and high levels of mental effort during poor performances; anxiety and happiness were associated with high levels of mental effort during good performances and low levels of mental effort during poor performances. Taken together, these studies point towards potential benefits accompanying high levels of excitement and potential disadvantages accompanying high levels of anxiety and happiness [6].

Original Research article

Front. Educ., 12 April 2021 | https://doi.org/10.3389/feduc.2021.632907

Analyzing Relationships Between Causal and Assessment Factors of Cognitive Load: Associations Between Objective and Subjective Measures of Cognitive Load, Stress, Interest, and Self-Concept

www.frontiersin.org

Nina Minkley,Kate M. Xu and Moritz Krell

"Emotion (Stress)

Emotions, in particular negative valence emotions, have been suggested to be a source of increased extraneous load (Sweller *et al*., 2019)" [7].

Research Articles, Behavioral/Cognitive

Reason's Enemy Is Not Emotion: Engagement of Cognitive Control Networks Explains Biases in Gain/Loss Framing

Rosa Li, David V. Smith, John A. Clithero, Vinod Venkatraman, R. McKell Carter and Scott A. Huettel

Journal of Neuroscience 29 March 2017, 37 (13) 3588-3598; DOI: https://doi.org/10.1523/JNEUROSCI.3486-16.2017

"In the classic gain/loss framing effect, describing a gamble as a potential gain or loss biases people to make risk-averse or risk-seeking decisions, respectively. The canonical explanation for this effect is that frames differentially modulate emotional processes, which in turn leads to irrational choice behavior. Here, we evaluate the source of framing biases by integrating functional magnetic resonance imaging data from 143 human participants performing a gain/loss framing task with meta-analytic data from >8000 neuroimaging studies. We found that activation during choices consistent with the framing effect were most

correlated with activation associated with the resting or default brain, while activation during choices inconsistent with the framing effect was most correlated with the task-engaged brain. Our findings argue against the common interpretation of gain/loss framing as a competition between emotion and control. Instead, our study indicates that this effect results from differential cognitive engagement across decision frames.

Significance Statement The biases frequently exhibited by human decision makers have often been attributed to the presence of emotion. Using a large fMRI sample and analysis of whole-brain networks defined with the meta-analytic tool Neurosynth, we find that neural activity during frame-biased decisions was more significantly associated with default behaviors (and the absence of executive control) than with emotion. These findings point to a role for neuroscience in shaping long-standing psychological theories in decision science.

Our study, using a large fMRI dataset and an even larger meta-analytic database, suggests that "less cognitive effort" versus "more cognitive effort" is the more accurate characterization of decision-making processes [8]"

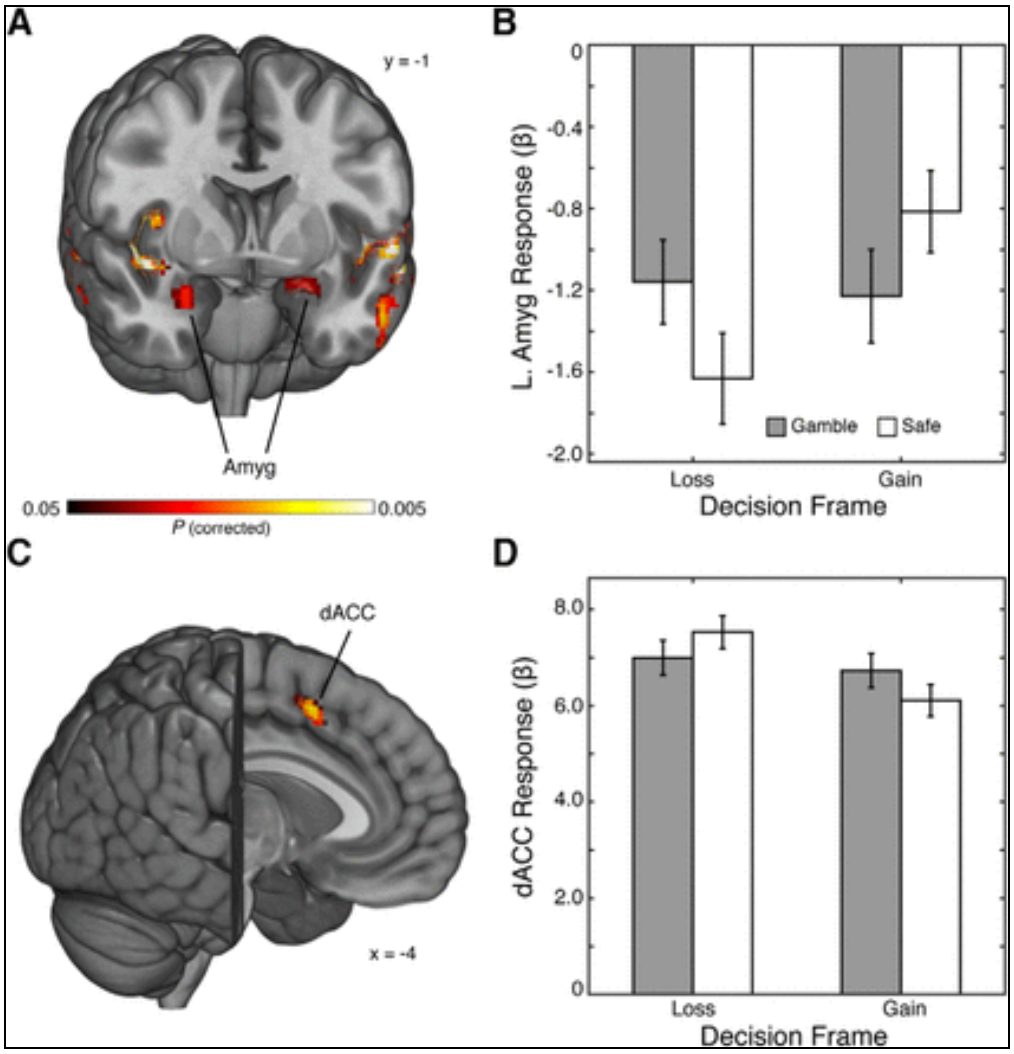

Fig 9: Neural framing effects in amygdala (frame-consistent choices) and dACC (frame-inconsistent choices).

A, We used an interaction contrast (see Eq. 1a) to identify regions with greater activation to frame-consistent choices than to frame-inconsistent choices. This analysis revealed widespread activation, including bilateral amygdala. B, Within the amygdala, we found increased response to gamble choices relative to safe choices when the decision was framed as a potential loss. In contrast, when the decision was framed as a potential gain, we observed increased responses to safe choices relative to gamble choices. C, We used an interaction contrast (see Eq. 1b) to identify regions with greater activation to frame-inconsistent choices than to frame-consistent choices. This analysis revealed activation within dACC. D, Within dACC, we found increased response to safe choices relative to gamble choices when the decision was framed as a potential loss. In contrast, when the decision was framed as a potential gain, we observed increased responses to gamble choices relative to safe choices. Reported activations are shown at $p < 0.05$ (corrected two-tailed t test). Error bars reflect the SEM. from Rosa Li *et al.*

REBT's ABCs of Emotions: A + B = C	
A	Attention paid to an event or experience.
B	Beliefs, interpretations, thoughts about A.
C	Consequences of A + B = feelings about A.
D	Dispute & challenge thoughts (B) about A.
E	Effect of disputing is finding new B about A.
F	Functional new feelings & responses to A.

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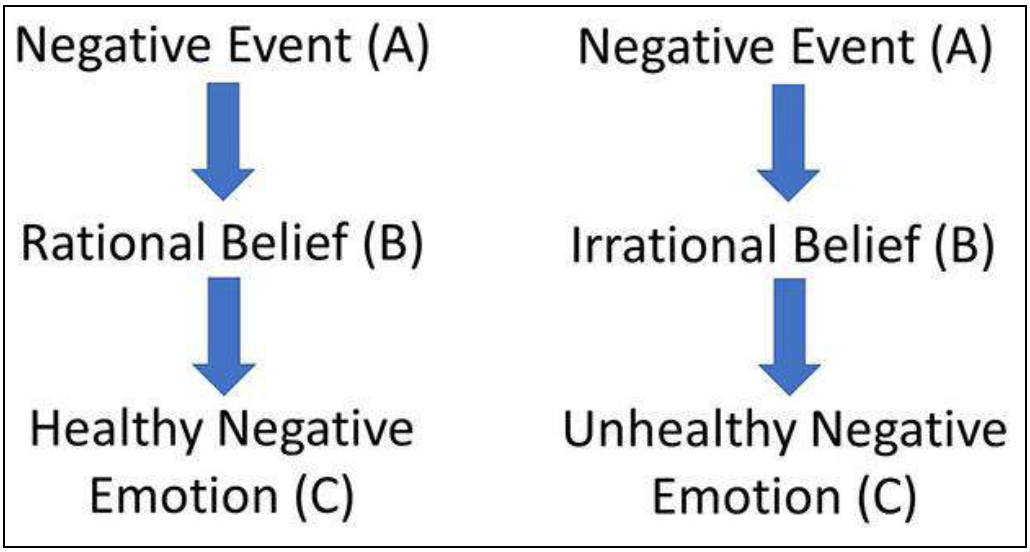
A	B	C
Activating Event is the Trigger a negative 'thought'	**Belief can be helpful or unhelpful**	**Consequences in my body of holding this unhelpful belief**
e.g.I must be perfect.	What is the underlying belief? ***To identify irrational beliefs look for dogmatic demands (musts, should, absolutes).***	• Where is holding this belief getting me? • Is it helpful or self-defeating? • Where is the evidence to support the existence of my irrational belief? • Is it consistent with reality? • Is my belief Logical? Does it follow from what I have said?

Fig 10: from http://www.positivehealth.com/article/nlp/using-rational-emotional-behaviour-therapy-rebt-for-managing-internal-stress



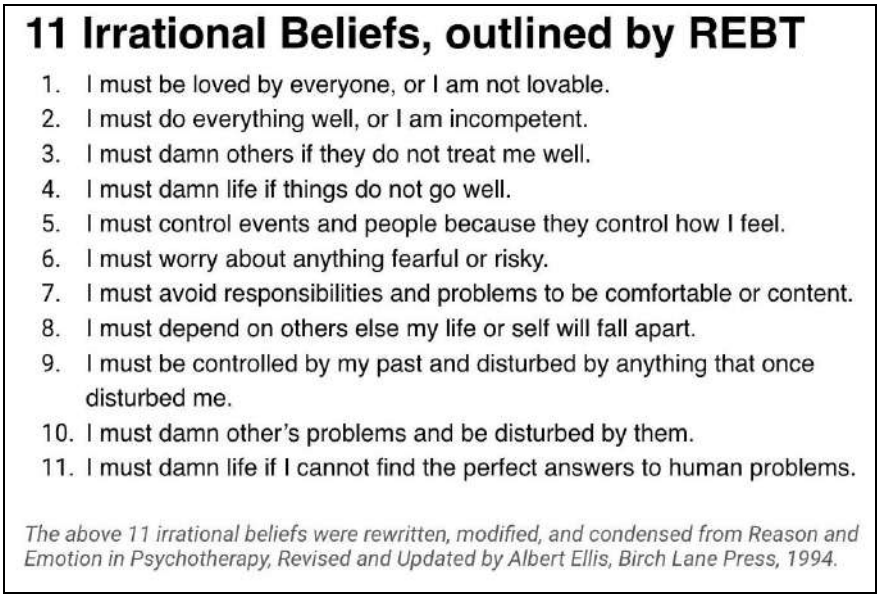


Fig 11: Clinical Psychology & Psychotherapy

Research Article

Pathways into psychopathology: Modeling the effects of trait emotional intelligence, mindfulness, and irrational beliefs in a clinical sample

K. V. Petrides,María G. Gómez,Juan-Carlos Pérez-González First published: 21 February 2017 https://doi.org/10.1002/cpp.2079Citations: 26

"Our emotional perceptions, reasoning processes, and ability to maintain awareness on a moment-to-moment basis play an important role in the development and maintenance of mental illness. Up to

about half the variance in total MCMI scores can be accounted for by individual differences in trait EI, mindfulness, and irrational beliefs.

The structural equation and hierarchical regression models suggest that negative emotional self-perceptions are perhaps more fundamental than irrational thinking or lack of awareness in the development of psychopathology. It seems that such self-perceptions lead to psychopathology both directly, but also indirectly, through clouding awareness and fueling irrational thinking. A series of hierarchical regressions demonstrated that trait EI is a stronger predictor of psychopathology than mindfulness and irrational beliefs combined. We conclude that the identified pathways can provide the basis for the development of safe and effective responses to the ongoing mental health and overmedication crises [9]."

(Toward a Rational and Mechanistic Account of Mental Effort. Available from: https://www.researchgate.net/publication/311825391_Toward_a_Rational_and_Mechanistic_Account_of_Mental_Effort [accessed Apr 24 2022].

"Given this seemingly immediate availability to introspection,mental effort is surprisingly difficult to Pin down as an objectof scientific study.

What exactly is mental effort, from an objective rather than introspective point of view?

What exactly is going on when we try harder on a cognitive task or decide that this trying is not worth it?

What is being conserved when we conserve our cognitive resources, and how do we decide the manner in which those resources get allocated?

And how can we identify the neural mechanisms underlying such a subjective construct?

Our aim in the present article is to review some areas of recent progress in addressing these questions [10] "

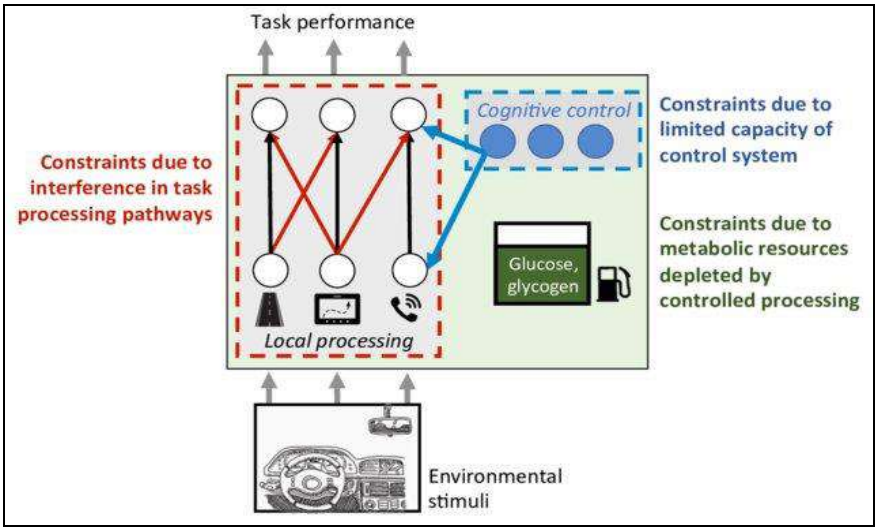


Fig 12: Schematic summary of possible control limitations.

Different accounts of the potential sources of control costs are shown for an example case of a driver trying to attend multiple streams of information. Resource-based accounts (green) propose that control costs reflect the limitations of a central metabolic resource that depletes with extended use of cognitive control. from DOI: 10.1146/annurev-neuro-072116-031526
Published: 12 July 2007
Irrational Beliefs and Unconditional Self-Acceptance. III. The Relative Importance of Different Types of Irrational Belief
Martin F. Davies
Journal of Rational-Emotive & Cognitive-Behavior Therapy volume 26, pages102–118 (2008)Cite this article
"In two studies, one correlational (N = 158) and one experimental (N = 128), using college students, it was found that Need for Achievement, Need for Approval and Self-Downing were the most important irrational beliefs of the General Attitude and Belief Scale predicting unconditional self-acceptance. The Need for Comfort, Demand for Fairness and Other-Downing subscales were found to be less influential. The findings were discussed in terms of Ellis' theoretical formulation of four higher-order types of irrational belief processes (demandingness, awfulizing, low-frustration tolerance and self-downing), empirical research on different irrational belief themes, the distinction between ego disturbance and discomfort disturbance in REBT and the distinction between sociotropy and autonomy in different forms of depression" [11].

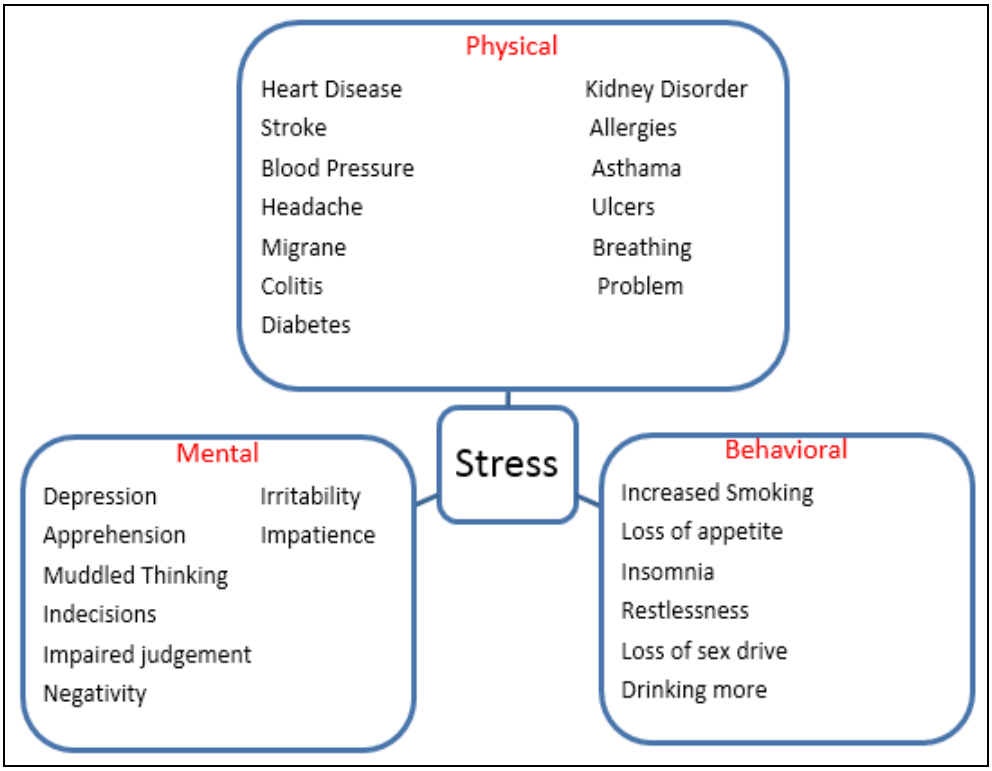


Fig 13: From M. Thakur

From from M. Thakur

"Some useful stress management techniques include:

Time Management: Time limitations can elicit stress in people's lives. Work schedules sometimes become overloaded, which causes some individuals to feel overwhelmed. In order to manage this kind of situation, one can make a plan of priorities to do the work accordingly. This will help to reduce the stress and even a manageable schedule which can complete within the time frame.

Self-limitations: Knowing your own limitation and performing your work accordingly helps to alleviate the unnecessary stress. Creating your own boundaries is essential for healthy, stress-free living. Boundaries mean we create some internal rules for ourselves to take care of our well-being. Sometimes it is good not to involve in any kind of racing thoughts which may also aggravate stress. It is suggestible to deviate your mind from that kind of thought and involve yourself with some activities which give relaxation and refreshment to your mind.

Friendly social network: Sometimes, a supportive network of friends and relatives help to face the challenging situation with stability and less stress. Their encouraging words and listening ears become supportive.

Reduce the noise: You may try to distract yourself from all kinds of technologically advanced gadget and manage some time to stay in quiet. You can notice that those things which you consider most important for day to day life are very trivial.

ABC technique: The well-known ABC (A – Adversity or stressful situation, B – Beliefs or the way response to the situation, C – Consequences or the result of your belief) technique was first introduced by psychiatrist DR. Albert Ellis, and later it was adopted by Martin Seligman. The purpose of the technique is to think optimistically.

Healthy Diet: A healthy balanced diet gives fuel to the body and mind function; it helps us to cope up with any stressful situation. Reducing the consumption of alcohol, caffeine, and sugar is a proven way of decreasing stress or anxiety. If our body gets proper nutrients, stress can likely occur in our everyday life.

Exercise: Maintaining a consistent routine exercise is a sign of following a healthy lifestyle. Exercise helps our body to

reduce tensions and relax muscles.

Meditation: Use the techniques of deep breathing, breathing exercise, yoga, yogic sleep, meditation to control our physical and mental being. Meditation helps to calm down our body and mind to awaken our inner power.

Sleep habit: Adequate sleep is necessary to rejuvenate ourselves. It is helpful to boost our immune power and also increases mental alertness, memory, and concentration.

Actually, stress comes about because our mind is everywhere, either regretting the past or glorifying the future. That is why we should develop certain stress management skill to cope up with stress in our daily activities and be able to adore healthy life."

Towards a new paradigm in the psychotherapy process research: An empirical study on text analysis and psychophysiology

Kleinbub Johann Roland,, Gennaro Alessandro, Palmieri Arianna,Benelli Enrico, Salvatore Sergio

"Introduction: Recent theoretical and empirical advancements in literature are leading toward a paradigm shift in the research of psychotherapy process, in terms of: a) a focus on moment-by-moment interpersonal or intersubjective exchanges, b) the study of their temporal dynamics, c) the preference for idiographic and explorative designs and d) the use of objective measurement tools such as physiological measures, and computer-assisted analysis of videos and transcripts of the clinical interactions.

Specifically,in regard to the latter, the use of Interpersonal Physiology as a tool to investigate the somatic perspective in the clinical setting is receiving increasing interest. IP consists in the analysis of the simultaneous physiological activity in two interacting persons and is being increasingly investigated as a biomarker of interpersonal emotional regulation.

Specifically, in psychotherapy research, the technique has been successfully used to associate the synchronization of skin conductance (SC) to various interpersonal constructs, such as empathy

and therapeutic alliance. While IP techniques have already been employed to investigate the interaction dynamics of a therapist-patient dyad, to the best

of our knowledge no research effort in literature has yet empirically studied the convergence between clinical micro-process and IP" [12]

Original Research Article

Front. Psychol., 29 March 2018 | https://doi.org/10.3389/fpsyg.2018.00427

Assessment of Affect Lability: Psychometric Properties of the ALS-18

Anna Contardi, Claudio Imperatori, Italia Amati, Michela Balsamo and Marco Innamorati

"To measure affect lability, Harvey *et al*. (1989) developed the Affective Lability Scales (ALS), a 58-item questionnaire measuring changeability among euthymia and four affect states (i.e., depression, elation, anger, and anxiety). The construct of affect lability has strong relationships with other personological constructs such as neuroticism and cyclothymia. Neuroticism (also known as emotional stability-instability or negative emotionality) is part of major models of normal personality structure (i.e., Eysenck's Three Factor model, and the Big Five model) and it is an ubiquitous element of many personality measures. Negative emotionality is a central component in neuroticism, along with cognitive and behavioral facets Questionnaires assessing neuroticism generally measure the frequency of negative emotional states and how easily they are experienced by the individual [13]."

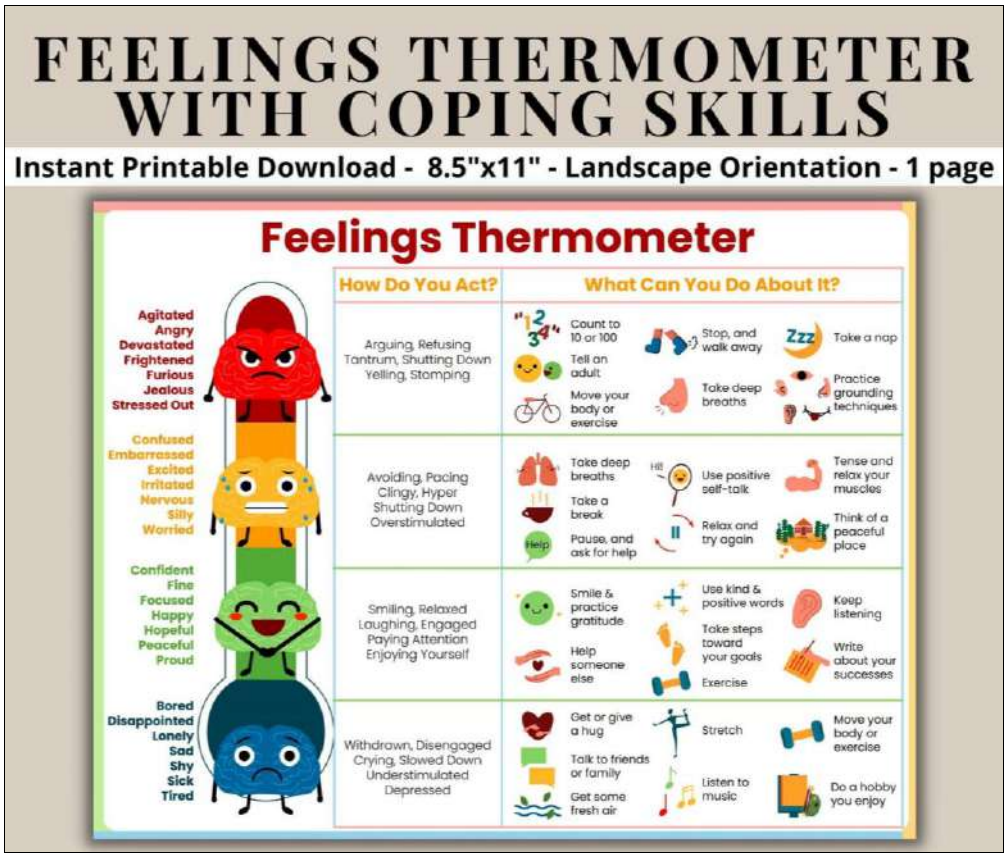


Fig 14: From https://mentalhealthcenterkids.com/products/feelings-thermometer-with-coping-skills-emotions-chart-poster-kids-teens

Experimental hypotesis project
In order to verify the entity in "mentale energy" use it is possible to think to an experimetal project
Involving 20 individuals.
They must to be divided in two groups : control A and interventistic B
Intervention: simply to give them the order to delay solution of problem during great emotional task
After a time like 24-48 horus.
Control : not applicable this upper rule
Blind : the member of this two groups A and B must to be not informed related this rules
Collecting the results: all episode must to be subjectually evalued on a scale from 1 to 10 related intensity of emotional disconform.
Results : all resulta must to be collected and recorded in a documenta file for the statistical analisys
Significativity : > 0,05

Results Interpretation: if in this esperimental hypotesys i twill be find a significative variation between control and intervention group it can be assumed that the delay order is effective to reduce this kind of stressor agent and that this expedient can be submitted to researcher to provide instrument for a behavioral improvement of the subject inetrested.

Discussion
- REBTS is an interesting instrumet that show as some irrational mental process can produce
- Behavioral mulfunction.
- Ruminate on problems, tunnel thinking, cathastrofic idea, low level of autostima and other similar
- Mechanims can use too much quantum of "mental energy " and this can produce in long time
- Various level of behavioral social disfunctions.

Conclusion
It is possible to consider that related various mental process (Irrational) and expecially in subject with mulfunction of the emotional sfera there is a relevant use of a so called " mental energy ".
A chronic permanence of this condition can evolve in great disconfort, stress, born out or depression status or anxia (In social enviroment, work, family).
In order to improve this vicious cycle it is fundamental to deeply study the mindset kinetics and the mental efforst needed in the various mental process (Rational or irrational) as well as to verify the contribute played in this process by reptilian brain, mammalian brain and by the cortex.
If in an primitive world (Archeo) the reaction of attack and escape was a safe life mechanism for many animals (Also humans) today this mechanism if not adeguately controlled can create varioous problems in today social situations.
A quantitative methods is needed to give a numeric value to all this process.
Brain and mind show a determinate and limitated level of mental energy so it is needed to use better it is possibile this extra ordinary instrument.

Conflict of interest: no

Etical consideration: every international rule is applied

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12. Original Research article Front. Psychol., 29 March 2018. https://doi.org/10.3389/fpsyg.2018.00427 Assessment of Affect Lability: Psychometric Properties of the ALS-18 Anna Contardi, Claudio Imperatori, Italia Amati, Michela Balsamo and Marco Innamorati