EXERCÍCIO E SAÚDE MENTAL

Dr. Eduardo Bodnariuc Fontes
Departamento de Educação Física

Sumário

Sábado

- Introdução
- Conceitos
- Evolução
- Respostas cerebrais ao exercício
- Conexão Mente-Corpo

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Domingo

- Prática
- Envelhecimento
- Estresse
- Esclerose Múltipla
- Alzheimer
- Epilepsia
- Parkinson
- Depressão
- Runner´s high
- Vício
- Felicidade
- Prazer

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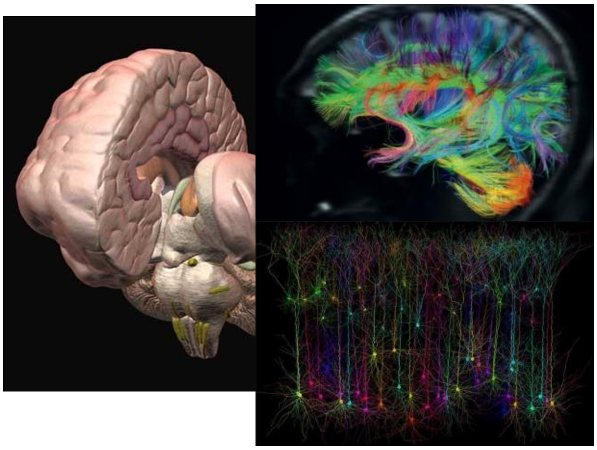
O que é Mente?

Latim *mèntem (pensar, conhecer, entender)*

- parte incorpórea, inteligente ou sensível do ser humano; espírito, pensamento, entendimento.

Estado da consciência ou subconsciência que possibilita a expressão da natureza humana.

'Mente' é um conceito bastante utilizado para descrever as funções superiores do cérebro humano relacionadas à cognição e comportamento.



SAÚDE MENTAL

- Não é ausência de doença, mas uma condição de bem estar biopsicosocial;
  - Organismo
  - Psiquismo
  - Adaptação social
- A doença mental é analisada em termos de sofrimento psíquico. Compromete a vida pessoal, familiar, educacional e profissional do indivíduo.

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1 in 4 OF US
WILL EXPERIENCE
MENTAL HEALTH
PROBLEMS
in our LIFETIMES.

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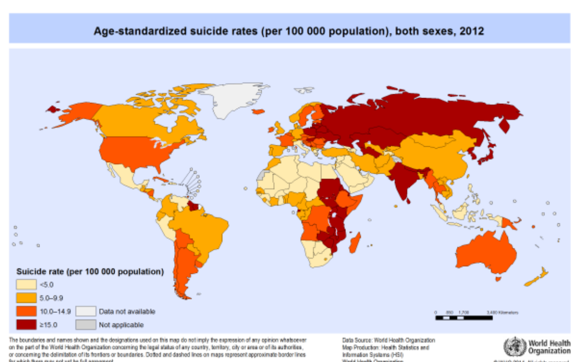

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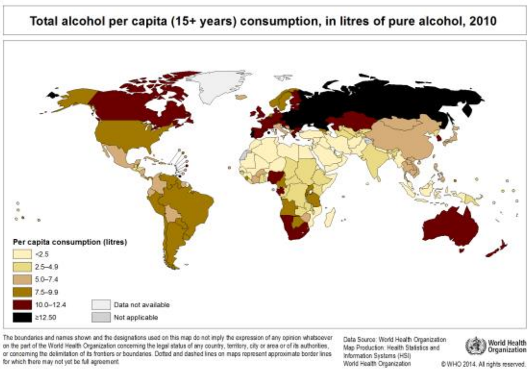
Total alcohol per capita (15+ years) consumption, in litres of pure alcohol, 2010
Per capita consumption (litres)
<2.5
2.5–4.9
5.0–7.4
7.5–9.9
10.0–12.4
≥12.50
Data not available
Not applicable
Data Source: World Health Organization
Map Production: Health Statistics and Information Systems (HSI)
World Health Organization
World Health Organization
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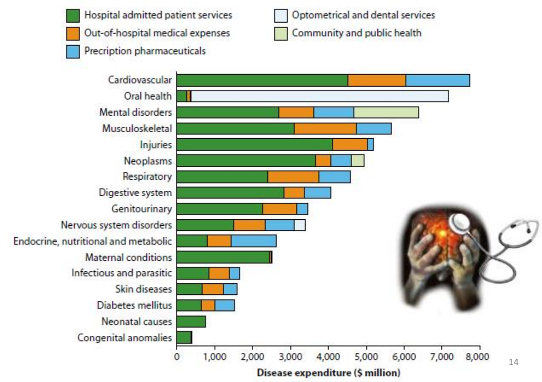
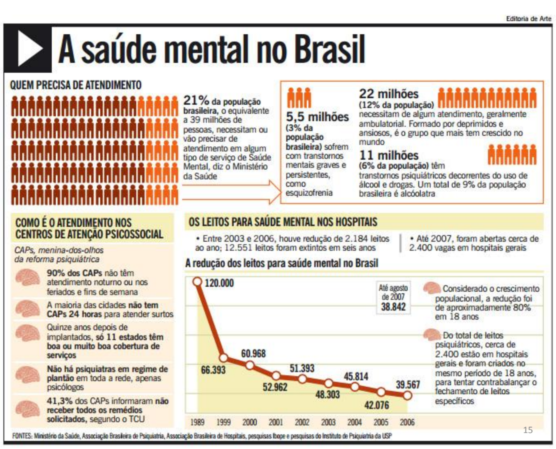

Hospital admitted patient services
Out-of-hospital medical expenses
Precription pharmaceuticals
Optometrical and dental services
Community and public health
Cardiovascular
Oral health
Mental disorders
Musculoskeletal
Injuries
Neoplasms
Respiratory
Digestive system
Genitourinary
Nervous system disorders
Endocrine, nutritional and metabolic
Maternal conditions
Infectious and parasitic
Skin diseases
Diabetes mellitus
Neonatal causes
Congenital anomalies
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
Disease expenditure ($ million)

14


Editoria de Arte
A saúde mental no Brasil
QUEM PRECISA DE ATENDIMENTO
21% da população brasileira, o equivalente a 39 milhões de pessoas, necessitam ou vão precisar de atendimento em algum tipo de serviço de Saúde Mental, diz o Ministério da Saúde
5,5 milhões (3% da população brasileira) sofrem com transtornos mentais graves e persistentes, como esquizofrenia
22 milhões (12% da população) necessitam de algum atendimento, geralmente ambulatorial. Formado por deprimidos e ansiosos, é o grupo que mais tem crescido no mundo
11 milhões (6% da população) têm transtornos psiquiátricos decorrentes do uso de álcool e drogas. Um total de 9% da população brasileira é alcóolatra
COMO É O ATENDIMENTO NOS CENTROS DE ATENÇÃO PSICOSSOCIAL
CAPs, menina-dos-olhos da reforma psiquiátrica
90% dos CAPs não têm atendimento noturno ou nos feriados e fins de semana
A maioria das cidades não tem CAPs 24 horas para atender surtos
Quinze anos depois de implantados, só 11 estados têm boa ou muito boa cobertura de serviços
Não há psiquiatras em regime de plantão em toda a rede, apenas psicólogos
41,3% dos CAPs informaram não receber todos os remédios solicitados, segundo o TCU
OS LEITOS PARA SAÚDE MENTAL NOS HOSPITAIS
• Entre 2003 e 2006, houve redução de 2.184 leitos ao ano; 12.551 leitos foram extintos em seis anos
• Até 2007, foram abertas cerca de 2.400 vagas em hospitais gerais
A redução dos leitos para saúde mental no Brasil
120.000
66.393
60.968
52.962
51.393
48.303
45.814
42.076
39.567
Até agosto de 2007 38.842
1989
1999
2000
2001
2002
2003
2004
2005
2006
Considerado o crescimento populacional, a redução foi de aproximadamente 80% em 18 anos
Do total de leitos psiquiátricos, cerca de 2.400 estão em hospitais gerais e foram criados no mesmo período de 18 anos, para tentar contrabalançar o fechamento de leitos específicos
FONTES: Ministério da Saúde, Associação Brasileira de Psiquiatria, Associação Brasileira de Hospitais, pesquisas Ibope e pesquisas do Instituto de Psiquiatria da USP

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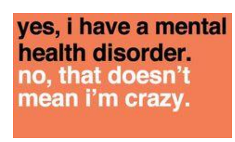
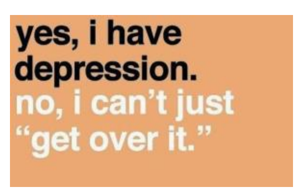

yes, i have a mental health disorder.
no, that doesn't mean i'm crazy.


yes, i have depression.
no, i can't just "get over it."

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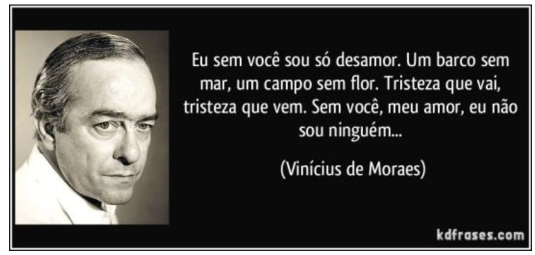
Eu sem você sou só desamor. Um barco sem mar, um campo sem flor. Tristeza que vai, tristeza que vem. Sem você, meu amor, eu não sou ninguém...
(Vinícius de Moraes)
kdfrases.com

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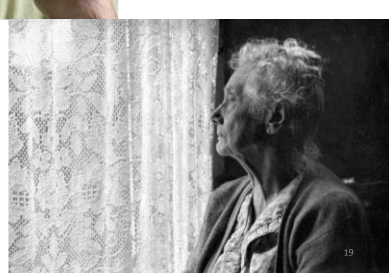

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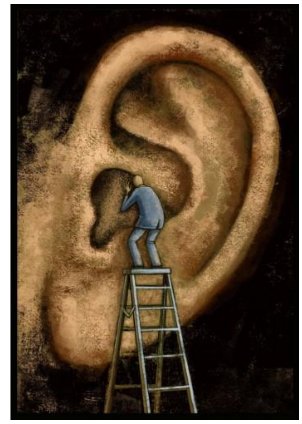

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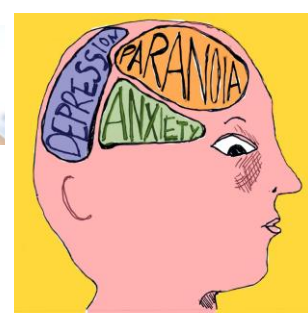

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WINNING WAYS TO WELLBEING
Give
Your time, your words, your presence
BE ACTIVE
DO WHAT YOU CAN, ENJOY WHAT YOU DO, MOVE YOUR MOOD
KEEP LEARNING
EMBRACE NEW EXPERIENCES, SEE OPPORTUNITIES, SURPRISE YOURSELF
CONNECT
TALK & LISTEN, BE THERE, FEEL CONNECTED
TAKE NOTICE
REMEMBER THE SIMPLE THINGS THAT GIVE YOU JOY
INTRODUCE THESE SIMPLE STRATEGIES INTO YOUR LIFE AND YOU WILL FEEL THE BENEFITS.
Mental Health Foundation of New Zealand

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Sem Saúde Mental
não há saúde.

26


Maior que a tristeza de não haver vencido é a vergonha de não ter lutado!
(Rui Barbosa)
kdfrases.com

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Evolução dos Seres Humanos

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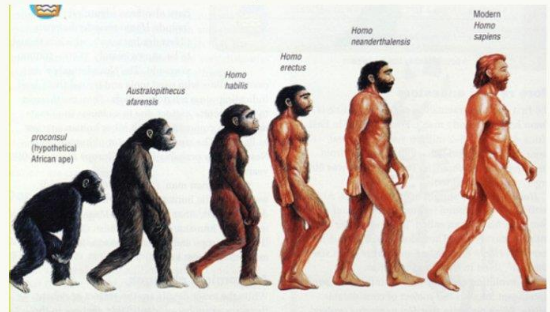
Evolução Humana



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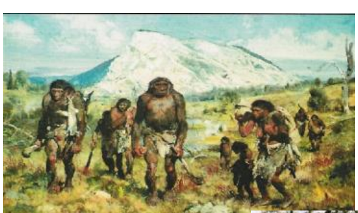

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PROCEEDINGS OF THE ROYAL SOCIETY B
Accepted: 25 October 2012
rspb.royalsocietypublishing.org

Linking brains and brawn: exercise and the evolution of human neurobiology

David A. Raichlen[1] and John D. Polk[2,3]

[1]School of Anthropology, University of Arizona, Tucson, AZ 85721, USA
[2]Department of Anthropology, University of Illinois Urbana–Champaign, Urbana, IL 61801, USA
[3]Department of Surgery, University of Illinois Urbana–Champaign, Urbana, IL 61801, USA

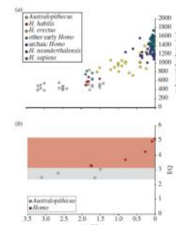
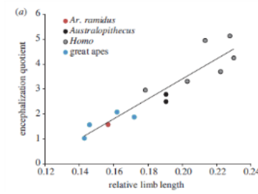
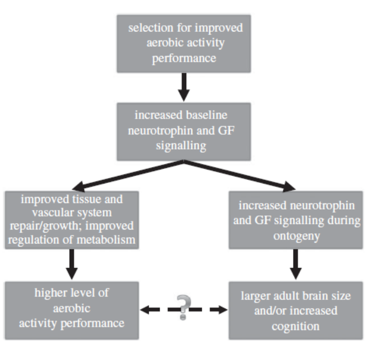


Figure 1. Absolute and relative brain sizes of hominins. (a) Endocranial volumes of hominin skulls from Holloway *et al.* [12]. (b) Encephalization quotients (EQs) through time for hominin taxa (from Lieberman [9]). EQs are a measure of the difference between actual and expected endocranial volumes. Grey area denotes australopithecine EQs; red area denotes Homo EQs. Ma is millions of years before present.



Capacidade aeróbia contribuiu para o aumento do tamanho relativo do cérebro



OPEN ACCESS Freely available online
PLoS one

Relationship between Exercise Capacity and Brain Size in Mammals

David A. Raichlen[1*], Adam D. Gordon[2]

1 School of Anthropology, University of Arizona, Tucson, Arizona, United States of America, 2 Department of Anthropology, University at Albany-SUNY, Albany, New York, United States of America

Abstract

Background: A great deal of experimental research supports strong associations between exercise, cognition, neurogenesis and neuroprotection in mammals. Much of this work has focused on neurogenesis in individual subjects in a limited number of species. However, no study to date has examined the relationship between exercise and neurobiology across a wide range of mammalian taxa. It is possible that exercise and neurobiology are related across evolutionary time. To test this hypothesis, this study examines the association between exercise and brain size across a wide range of mammals.

Methodology/Principal Findings: Controlling for associations with body size, we examined the correlation between brain size and a proxy for exercise frequency and capacity, maximum metabolic rate (MMR; ml O_2 min^{-1}). We collected brain sizes and MMRs from the literature and calculated residuals from the least-squares regression line describing the relationship between body mass and each variable of interest. We then analyzed the correlation between residual brain size and residual MMR both before and after controlling for phylogeny using phylogenetic independent contrasts. We found a significant positive correlation between maximum metabolic rate and brain size across a wide range of taxa.

Conclusions: These results suggest a novel hypothesis that links brain size to the evolution of locomotor behaviors in a wide variety of mammalian species. In the end, we suggest that some portion of brain size in nonhuman mammals may have evolved in conjunction with increases in exercise capacity rather than solely in response to selection related to cognitive abilities.

EFEITO DO EXERCÍCIO FÍSICO NO NÍVEIS DE BDNF

Autor	Aumento concentração de BDNF plasmático/sérico	Sujeitos
Gold *et al.* 2003	30 min Bike 60%VO2	Adulto saudáveis e indivíduos com esclerose múltipla
Vega *et al.* 2006	Sessão única de exercício incremental máximo	atletas
Winter *et al.* 2007	alta intensidade de corrida (2 corridas até a exaustão com 3 min de descanso)	Jovens saudáveis
Tang *et al.* 2008	alta intensidade de step por 15 min	Jovens saudáveis
Rasmussen *et al.* 2009	**4 horas de canoagem**	
Yarrow *et al.* 2010	sessão única de exercício resistido	
Castellano and White, 2008	4 semanas de treino	pacientes com esclerose múltipla
Zoladz *et al.* 2010	5 semanas de treino moderado-intenso	adultos saudáveis
Yarrow *et al.* 2008	5 semanas de treinos resistidos	jovens saudáveis sedentários
Ferris et al. 2007	A concentração do BDNF depende do tipo de exercício	

O treino induzido aumenta a concentração de BDNF

- Pode melhor o humor[1]
- Proteção e regulação de vários tipos de tecidos[2]
- Neoangiogênese do músculo cardíaco e esquelético[3]
- Auxilia na eficácia ao tratamento de antidepressivos farmacológico [4]
- Melhora no aprendizado e memória de atletas[5]

1 Duman et al 2008; 2Duman et al 2000, Cotman, 2002; 3Donovan et al. 2000, Nakahashi et al 2000;4 Russo-Neustadt et al, 200; 5 Rogoz, 2007;

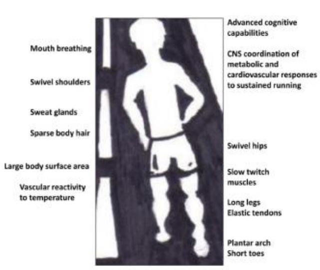
review article

Endurance running and the evolution of *Homo*

Dennis M. Bramble[1] & Daniel E. Lieberman[2]

[1]Department of Biology, University of Utah, Salt Lake City, Utah 84112, USA
[2]Peabody Museum, Harvard University, Cambridge, Massachusetts 02138, USA

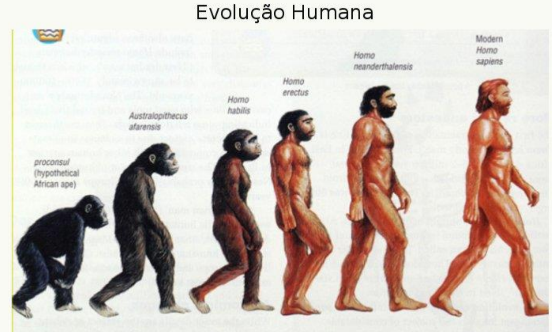
NATURE | VOL 432 | 18 NOVEMBER 2004 | www.nature.com/nature



Características anatômicas (biomecânicas) e fisiológicas tornam os humanos especiais em sustentar corrida de resistência

Caçadores e *coletores*

Evolução Humana



Desempenho motor excepcional



41




42

Desempenho motor excepcional

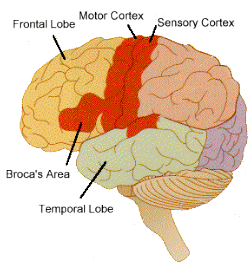
Coordenação motora fina

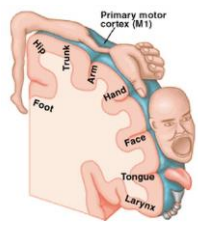
43

Fala

Coordenação motora fina

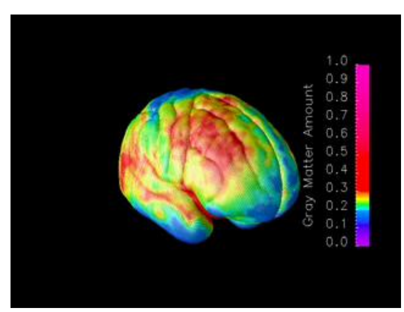
44


Frontal Lobe
Motor Cortex
Sensory Cortex
Broca's Area
Temporal Lobe

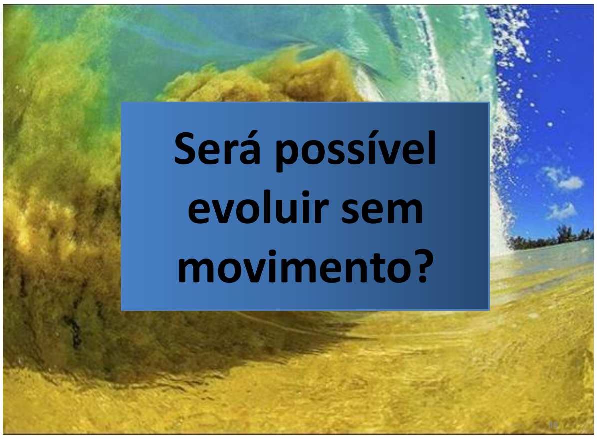

Primary motor cortex (M1)
Hip
Trunk
Arm
Hand
Foot
Face
Tongue
Larynx

45


FUTURO ???


Gray Matter Amount
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0

48



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REGULAÇÃO CEREBRAL DO EXERCÍCIO

51

Decisão

Planejamento

Ação

52

Decisão

- Meu irmão disse que remar é legal.
- Quero ficar bonitão no verão.
- Minha mãe mandou.
- Meu professor de EF me obrigou.
- Quero ganhar uma medalha nas Olimpíadas no Rio – 2016.
- É minha chance de ganhar dinheiro.

53

Planejamento

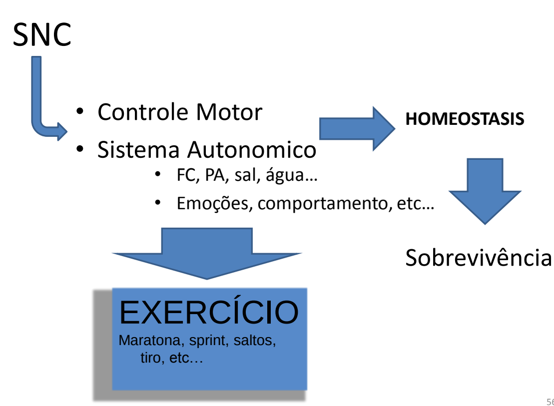
- Correr forte ou fraco?
- Rápido no início e devagar no fim?
- Curto ou longo?
- Ingerir água e CHO durante?
- Quero fazer o mínimo de esforço possível.
- Vou correr e ver no que vai dar...

54

Ação

- Vish, meu planejamento falhou, qual era o plano B mesmo?
- Tenho que colocar mais peso!
- Vou acelerar, pois meu adversário está se distanciando!
- Nossa, hoje está um calor danado.
- Não consigo me concentrar na técnica do nado, não paro de pensar na briga que tive com minha namorada.
- Estou me sentindo cansado e não vou conseguir dar um sprint no final.

55



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Tudo bem?

Fisiológicos
- Frio?
- Come?
- Sede?
- Dor?

Psicológicos
- Felizes?
- Tristes?
- Raiva?
- Desmotivado?

PERCEPÇÃO

57

6	Sem nenhum esforço
7	
	Extremamente leve
8	
9	Muito leve
10	
11	Leve
12	
13	Um pouco intenso
14	
15	Intenso (pesado)
16	
17	Muito Intenso
18	
19	Extremamente intenso
20	Máximo esforço

Escala RPE de Borg
© Gunnar Borg, 1970, 1985, 1994, 1998

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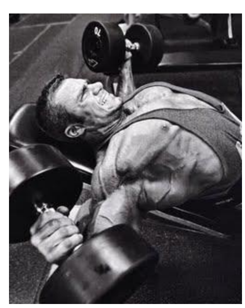

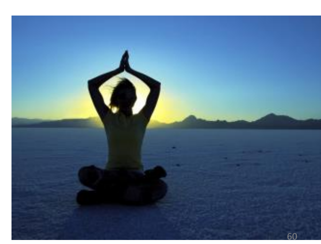

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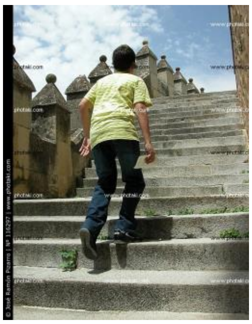


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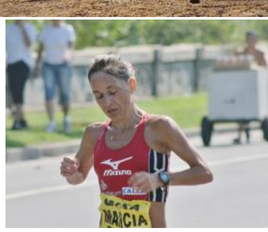





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66

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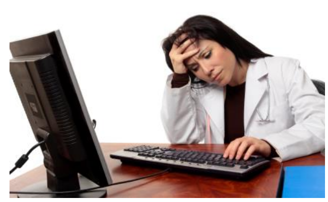

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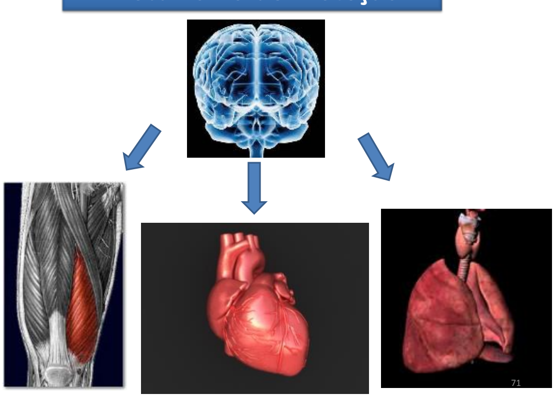
CONTROLE CEREBRAL DO EXERCÍCIO

Mecanismo de Proteção



PERCEPÇÃO DE ESFORÇO

Determinação do VO2 Máximo

Eur J Appl Physiol (2006) 97: 535–541
DOI 10.1007/s00421-006-0213-x

ORIGINAL ARTICLE

Roger G. Eston · James A. Faulkner
Elizabeth A. Mason · Gaynor Parfitt

The validity of predicting maximal oxygen uptake from perceptually regulated graded exercise tests of different durations

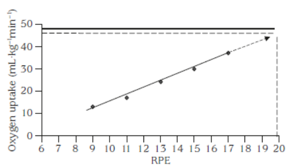


Fig. 3 Example of predicting $\dot{V}O_{2max}$ (dotted line), using linear regression analysis, from data accumulated from RPE 9, 11, 13, 15 and 17. The solid line represents the participant's measured $\dot{V}O_{2max}$ reported from a prior graded exercise test.

Research article

The validity of submaximal ratings of perceived exertion to predict one repetition maximum

Roger Eston ✉ and Harrison James Llewelyn Evans
School of Sport and Health Sciences, University of Exeter, Exeter, UK

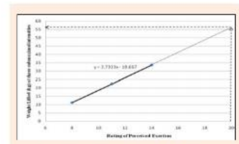


Figure 3. Extrapolation of sub-maximal RPE and weight lifted to RPE 20 using linear regression. In the above equation, when x is RPE 20 (theoretical maximal RPE), the predicted 1-RM = 56 kg.

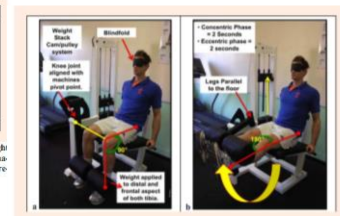


Figure 2. Knee extension procedure: a) Knee flexion, b) knee extension.

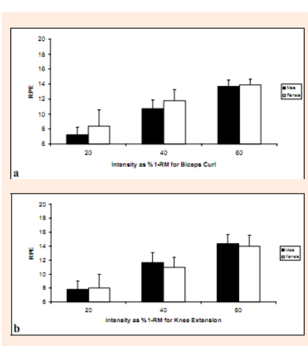


Figure 6. Comparisons between perceived exertion by gender at different intensities during the biceps curl (a) and knee extension (b). Values are mean ± SD. There was a significant difference in RPE between each intensity for both biceps curl and knee extension ($p < 0.001$).

Prescrição da Intensidade de Treinamento

The Borg Category Rating Scale

Least effort
6
7 very, very light
8
9 very light
10
11 fairly light
12
13 somewhat hard
14
15 hard
16
17 very hard
18
19 very, very hard
20
Maximum effort

ENDURANCE TRAINING ZONE

STRENGTH TRAINING ZONE

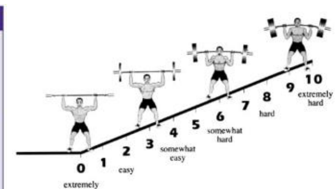
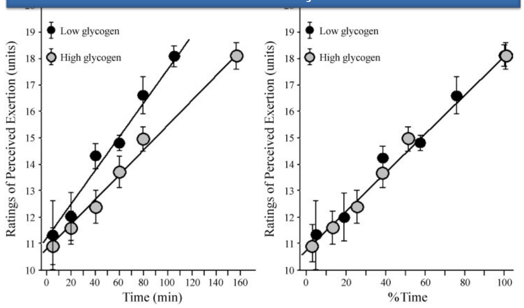


FIGURE 1. OMNI Perceived Exertion Scale for Resistance Exercise.

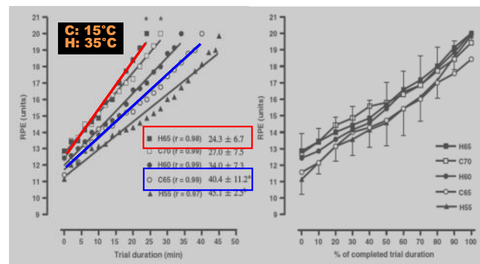
PERCEPÇÃO SUBJETIVA DE ESFORÇO COMO PREDITOR DO TEMPO DE EXAUSTÃO EM CONDIÇÃO DE HIPOGLICEMIA



Noakes 2004 (Baldwin 2003)

UNICAMP

PERCEPÇÃO SUBJETIVA DE ESFORÇO COMO PREDITOR DO TEMPO DE EXAUSTÃO EM DIFERENTES TEMPERATURAS



Crewe et al, 2008

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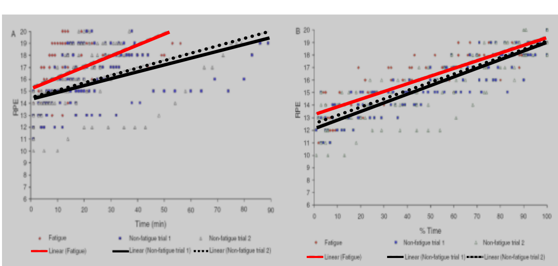
PERCEPÇÃO SUBJETIVA DE ESFORÇO COMO PREDITOR DO TEMPO DE EXAUSTÃO EM CONDIÇÃO DE FADIGA PRÉVIA



A) Fadiga prévia: Incremental Exaustivo → 15 min repouso → 75%VO_2max até exaustão

B) Sem fadiga prévia: 75%VO_2max até exaustão

Eston et al, 2007

THE PREFERRED AND NON-PREFERRED MUSIC INFLUENCE ON THE RATING OF PERCEIVED EXERTION, HEART HATE AND PERFOMANCE

PRISCILA M. NAKAMURA,[1] GLEBER PEREIRA,[1] FÁBIO. Y. NAKAMURA,[2] AND EDUARDO KOKUBUN[1]

[1]Departament of Physical Education, São Paulo State University, Rio Claro, SP, Brazil; [2]Center of Physical Education and Sport, Londrina State University, Londrina, Brazil.

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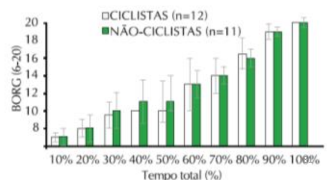
ARTIGO ORIGINAL

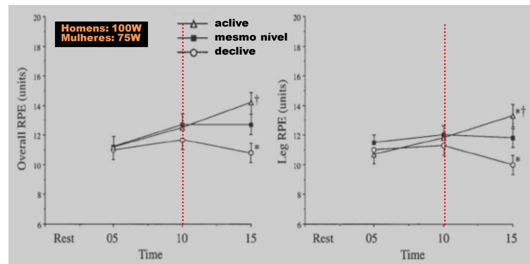
O nível de treinamento não influencia a percepção subjetiva de esforço durante um teste incremental

Training level does not influence the rating of perceived exertion during an incremental test

Bruno de Paula Caraça Smirmaul [1]
José Luiz Dantas [2]
Eduardo Bodnariuc Fontes [1]
Alexandre Hideki Okano [3]
Antonio Carlos de Moraes [1]



EFEITO DA HIPNOSE SOBRE A PERCEPÇÃO SUBJETIVA DE ESFORÇO



Williamson et al, 2001

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Formação de PSE

- O ser humano é psico-somático, isto é, fatores psico-sociais, medo, ansiedade e personalidade podem afetar as respostas somáticas, portanto, a International Organization for Standardization (1981) recomenda que sejam observados tanto dados objetivos (**quantitativos**) quanto subjetivos (**perceptivos**) para melhorar a eficiência da prescrição e prática de atividades físicas. Muitos julgamentos qualitativos podem, através de expressões verbais, ter utilidade ao se avaliar a intensidade durante o exercício.

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Como PSE é calculada?

- Fisiológicos?
- Psicológicos?
  - Prazer
  - Atenção desviada
  - Motivação
  - Experiência Prévia
  - Humor
  - Fadiga mental?

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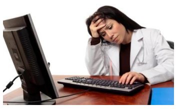
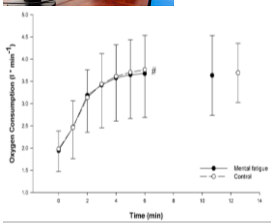
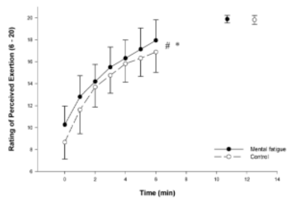
MENTAL FATIGUE IMPAIRS PHYSICAL PERFORMANCE IN HUMANS





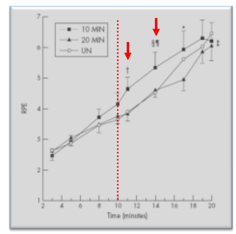


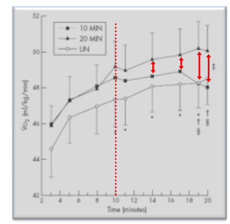
Marcora *et al.*, 2009

COMPORTAMENTO DA PERCEPÇÃO SUBJETIVA DO ESFORÇO COM CONHECIMENTO PRÉVIO DO TEMPO E SITUAÇÃO DE DECEPÇÃO

TESTE CONTÍNUO $75\%VO_2max$

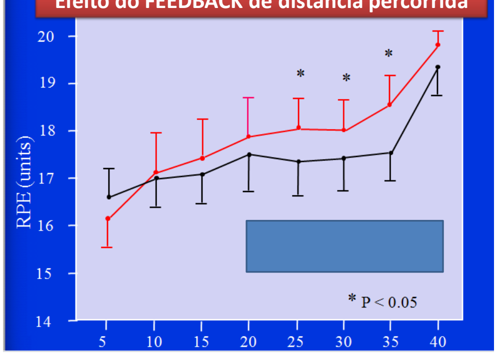
20 MIN: instruídos a permanecerem por 20 min
10 MIN: instruídos a permanecerem por 10 min + 10 min
UN: sem informação do tempo de exercício





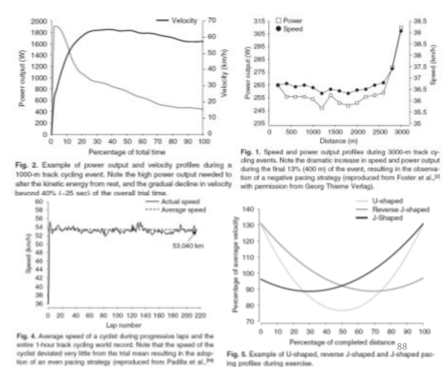
Baden et al 2005

Efeito do FEEDBACK de distância percorrida



Swart et al, 2009

PACING STRATEGY




CAPES
essm
EXERCISE SCIENCE AND SPORTS MEDICINE

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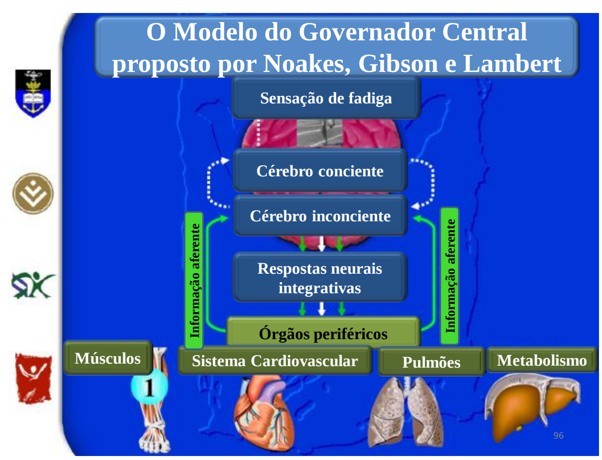
O que limita a habilidade de aumentar a captação de oxigênio?
A ausência do cérebro
a. O_2 diffusion
b. Ventilation
c. Alveolar ventilation: perfusion ratio
d. Hb - O_2 affinity
2.
a. Cardiac output (heart rate, stroke volume)
b. Arterial blood pressure
c. Hb concentration
3. PERIPHERAL CIRCULATION
a. Flow to non-exercising regions
b. Muscle blood flow
c. Muscle capillary density
d. O_2 diffusion
e. Muscle vascular conductance
f. O_2 extraction
g. Hb - O_2 affinity
4. MUSCLE METABOLISM
a. Enzymes and oxidative potential
b. Energy stores
c. Myoglobin
d. Mitochondria - size and number
e. Muscle mass and fiber type
f. Substrate delivery
Loring B. Rowell. Human circulation.
Regulation during physical stress. Oxford University Press, New York, p.243 1986.
First published in Federation Proceedings 59; 1506-1513, 1980.
92

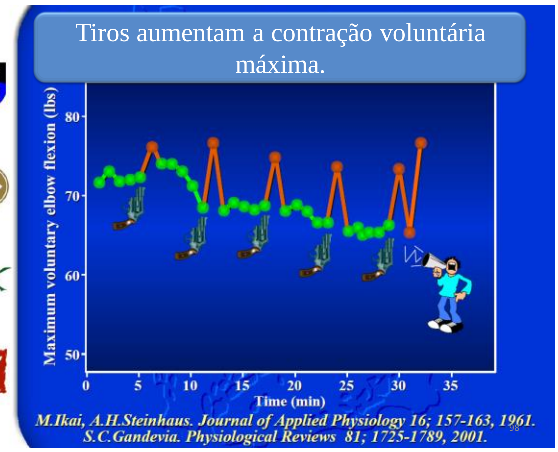

Árvore familiar
traçando a
dos difer
modelos de
do Exer
TRATADO DE FISIOLOGIA DO TRABALHO
PROVA DE ESFORÇO
Energy
Fisiologia do Exercício
MEDICINA DO ESPORTE
Fisiologia do Esporte e do Exercício
Krogh 1923
Fletcher & Hopkins 1907
Hill, Long Lupton 1923
Christensen 1937
Astrand 1950
Saltin 1967
Ekblom 1972
Daniels 1970
Wasserman & Whipp 1967
Gollnick 1970
Coyle 1986
Costill 1960
Pollock
Weibel 1990's
and exercise performance
Physiological determinants of oxygen limitations during exercise
CAN
DEN
GER
ITALY
RSA
93


O que faz a Ferrari ir tão rápido?


O Modelo do Governador Central proposto por Noakes, Gibson e Lambert
Sensação de fadiga
Cérebro conciente
Cérebro inconciente
Respostas neurais integrativas
Órgãos periféricos
Informação aferente
Informação aferente
Músculos
Sistema Cardiovascular
Pulmões
Metabolismo
96

Percepção de
esforço

97



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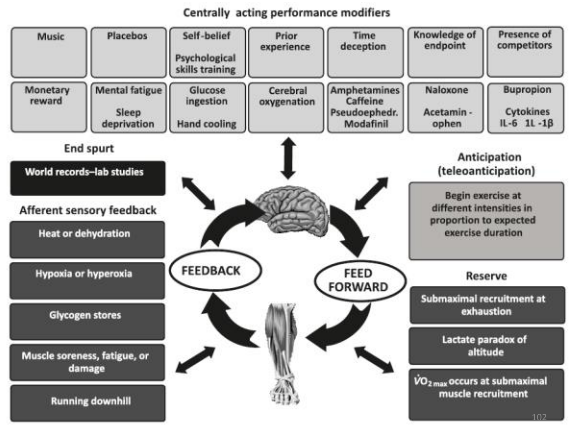
REVIEW / SYNTHÈSE

Time to move beyond a brainless exercise physiology: the evidence for complex regulation of human exercise performance

Timothy David Noakes

Eduardo Fontes



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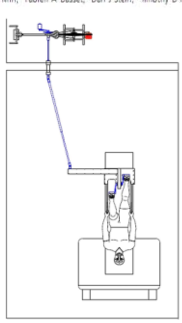
BJSM Online First, published on June 1, 2013 as 10.1136/bjsports-2012-091924
Original article

Brain activity and perceived exertion during cycling exercise: an fMRI study

Eduardo B Fontes,[1] Alexandre H Okano,[2] François De Guio,[3] Elske J Schabort,[4] Li Li Min,[1] Fabien A Basset,[5] Dan J Stein,[6] Timothy D Noakes[4]



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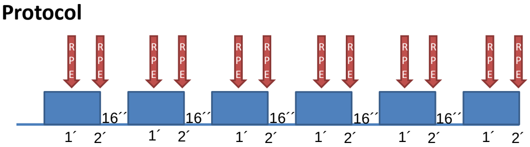
METHODS

Subjects:
Seven healthy and physically active male
(26.6 ± 4.0 years; 78.1 ± 6.7 kg; 179.4 ± 5.4 cm)

Protocol



constant-load: ~1.25 W/Kg
cadence: 60 rpm

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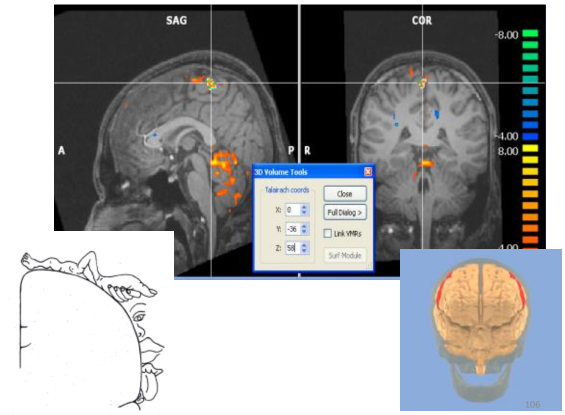


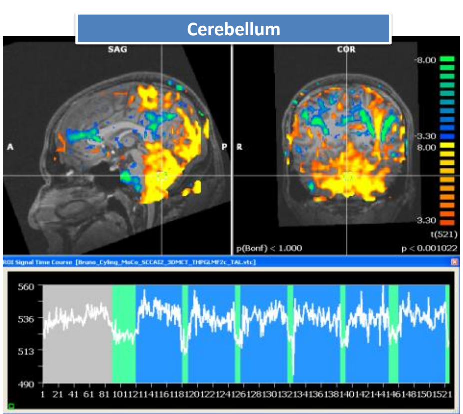


Table 1. Individual responses of ratings of perceived exertion (RPE) during every minute of the six bouts of two minutes constant-load protocol.

Name	power output (W)	1min	2min	1min	2min	1min	2min	1min	2min	1min	2min	1min	2min
Sub 1	95	12	14	13	16	15	17	15	18	17	18	16	18
Sub 2	95	16	17	16	17	16	17	16	18	16	18	15	17
Sub 3	100	11	12	12	12	13	13	13	13	13	13	13	13
Sub 4	110	14	15	14	14	14	15	15	15	15	15	15	16
Sub 5	105	13	14	14	16	15	17	16	18	17	19	18	19
Sub 6	135	14	15	14	15	14	16	11	15	14	16	15	16
Sub 7	125	14	15	15	16	16	17	17	18	17	19	17	19

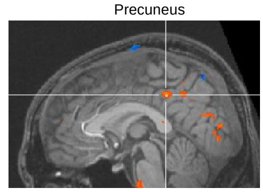
Table 2. Individual responses of the four analyzed subjects that attended the criteria of higher and lower ratings of perceived exertion 15 from borg scale 6-20.

Name	1min	2min	1min	2min	1min	2min	1min	2min	1min	2min	1min	2min
Sub 1	L	L	L	H	L	H	L	H	H	H	H	H
Sub 5	L	L	L	H	L	H	H	H	H	H	H	H
Sub 6	L	L	L	L	L	H	L	L	L	H	L	H
Sub 7	L	L	L	H	H	H	H	H	H	H	H	H

RESULTS

Contrast 15 RPE:H > L

Precuneus




CNS SPECTRUMS The International Journal of Neuropsychiatric Medicine

The Precuneus and Consciousness

Andrea E. Cavanna, MD

CNS Spectr. 2007;12(7):545-552

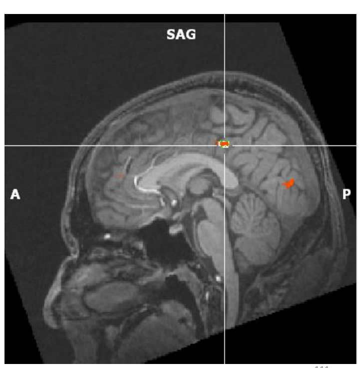
Abstract

Introduction

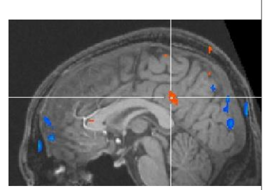
Functional Anatomy of the Posteromedial Parietal Lobe

Contrast 17 RPE:H > L

Precuneus



Cingulate gyrus

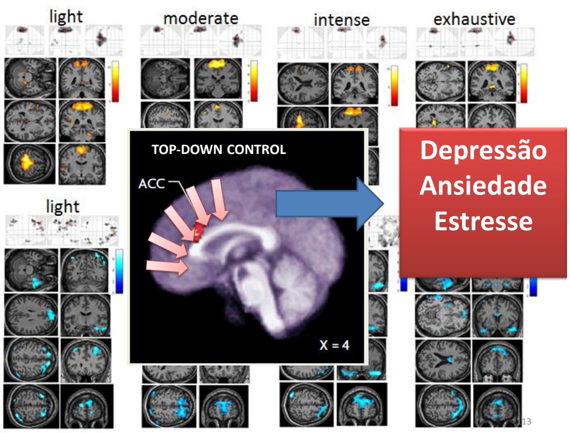



REVIEWS

The integration of negative affect, pain and cognitive control in the cingulate cortex

Alexander J. Shackman, Tim V. Salomons, Heleen A. Slagter, Andrew S. Fox, Jameel J. Winter and Richard J. Davidson

Abstract | It has been argued that emotion, pain and cognitive control are functionally segregated in distinct subdivisions of the cingulate cortex. However, recent observations encourage a fundamentally different view. Imaging studies demonstrate that negative affect, pain and cognitive control activate an overlapping region of the dorsal cingulate — the anterior midcingulate cortex (aMCC). Anatomical studies reveal that the aMCC constitutes a hub where information about reinforcers can be linked to motor centres responsible for expressing affect and executing goal-directed behaviour. Computational modelling and other kinds of evidence suggest that this intimacy reflects control processes that are common to all three domains. These observations compel a reconsideration of the dorsal cingulate's contribution to negative affect and pain.



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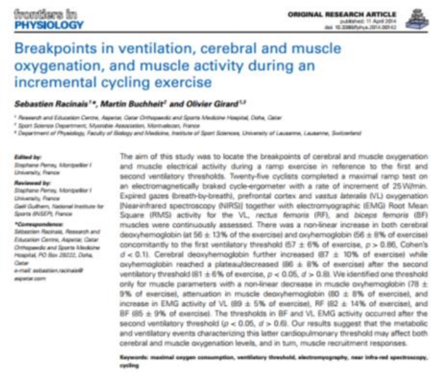

frontiers in PHYSIOLOGY
ORIGINAL RESEARCH ARTICLE
published: 11 April 2014
doi: 10.3389/fphys.2014.00142

Breakpoints in ventilation, cerebral and muscle oxygenation, and muscle activity during an incremental cycling exercise

Sebastien Racinais[1]*, Martin Buchheit[2] and Olivier Girard[1,3]

[1] Research and Education Centre, Aspetar, Qatar Orthopaedic and Sports Medicine Hospital, Doha, Qatar
[2] Sport Science Department, Myorobie Association, Montvalezan, France
[3] Department of Physiology, Faculty of Biology and Medicine, Institute of Sport Sciences, University of Lausanne, Lausanne, Switzerland

Edited by:
Stephane Perrey, Montpellier I University, France

Reviewed by:
Stephane Perrey, Montpellier I University, France
Gaël Guilhem, National Institute for Sports (INSEP), France

***Correspondence:**
Sebastien Racinais, Research and Education Centre, Aspetar, Qatar Orthopaedic and Sports Medicine Hospital, PO Box 29222, Doha, Qatar
e-mail: sebastien.racinais@aspetar.com

The aim of this study was to locate the breakpoints of cerebral and muscle oxygenation and muscle electrical activity during a ramp exercise in reference to the first and second ventilatory thresholds. Twenty-five cyclists completed a maximal ramp test on an electromagnetically braked cycle-ergometer with a rate of increment of 25 W/min. Expired gazes (breath-by-breath), prefrontal cortex and *vastus lateralis* (VL) oxygenation [Near-infrared spectroscopy (NIRS)] together with electromyographic (EMG) Root Mean Square (RMS) activity for the VL, *rectus femoris* (RF), and *biceps femoris* (BF) muscles were continuously assessed. There was a non-linear increase in both cerebral deoxyhemoglobin (at 56 ± 13% of the exercise) and oxyhemoglobin (56 ± 8% of exercise) concomitantly to the first ventilatory threshold (57 ± 6% of exercise, $p > 0.86$, Cohen's $d < 0.1$). Cerebral deoxyhemoglobin further increased (87 ± 10% of exercise) while oxyhemoglobin reached a plateau/decreased (86 ± 8% of exercise) after the second ventilatory threshold (81 ± 6% of exercise, $p < 0.05$, $d > 0.8$). We identified one threshold only for muscle parameters with a non-linear decrease in muscle oxyhemoglobin (78 ± 9% of exercise), attenuation in muscle deoxyhemoglobin (80 ± 8% of exercise), and increase in EMG activity of VL (89 ± 5% of exercise), RF (82 ± 14% of exercise), and BF (85 ± 9% of exercise). The thresholds in BF and VL EMG activity occurred after the second ventilatory threshold ($p < 0.05$, $d > 0.6$). Our results suggest that the metabolic and ventilatory events characterizing this latter cardiopulmonary threshold may affect both cerebral and muscle oxygenation levels, and in turn, muscle recruitment responses.

Keywords: maximal oxygen consumption, ventilatory threshold, electromyography, near infra-red spectroscopy, cycling

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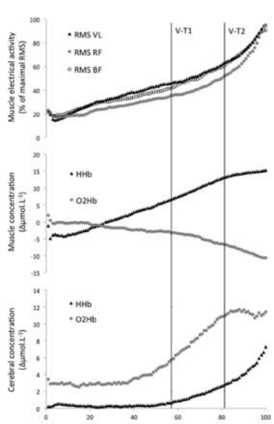

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COGNIÇÃO

- É o ato ou processo da aquisição do conhecimento que se dá através da percepção, da atenção, associação, memória, raciocínio, juízo, imaginação, pensamento e linguagem.
- A palavra Cognitione tem origem nos escritos de platão e Aristóteles.

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O que é Mente?

Latim *mèntem (pensar, conhecer, entender)*

- parte incorpórea, inteligente ou sensível do ser humano; espírito, pensamento, entendimento.

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Neuroscience 159 (2009) 1044–1054

THE EFFECT OF ACUTE TREADMILL WALKING ON COGNITIVE CONTROL AND ACADEMIC ACHIEVEMENT IN PREADOLESCENT CHILDREN

C. H. HILLMAN,[a*] M. B. PONTIFEX,[a] L. B. RAINE,[a] D. M. CASTELLI,[a] E. E. HALL[b] AND A. F. KRAMER[a]

[a]Department of Kinesiology and Community Health, 317 Louise Freer Hall, 906 South Goodwin Avenue, University of Illinois at Urbana, Champaign, Urbana, IL 61801, USA

[b]Elon University, Department of Exercise Science, Koury Athletic Center 143B, 2525 Campus Box, Elon, NC 27244, USA

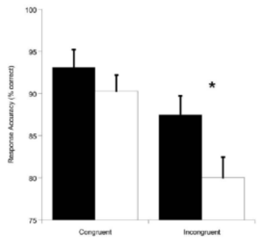

Fig. 2. Mean (SEM) RT and response accuracy for congruent and incongruent trials of the flanker task as a function of acute exercise (black bars) and resting (white bars) sessions.

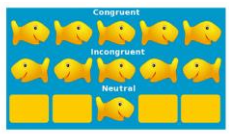

Fig. 1. Example task stimuli for a response indicating central target stimulus is pointing to the right. For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.

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Developmental Neuroscience

Original Paper

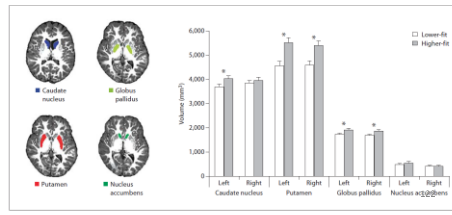
Dev Neurosci 2010;32:249–256
DOI: 10.1159/000316648

Received: March 29, 2010
Accepted after revision: June 8, 2010
Published online: August 6, 2010

Basal Ganglia Volume Is Associated with Aerobic Fitness in Preadolescent Children

Laura Chaddock[a] Kirk I. Erickson[c] Ruchika Shaurya Prakash[d] Matt VanPatter[a] Michelle W. Voss[a] Matthew B. Pontifex[b] Lauren B. Raine[b] Charles H. Hillman[b] Arthur F. Kramer[a]

[a]Department of Psychology, Beckman Institute for Advanced Science and Technology, and [b]Department of Kinesiology and Community Health, University of Illinois at Urbana-Champaign, Urbana, Ill., [c]Department of Psychology, University of Pittsburgh, Pittsburgh, Pa., and [d]Department of Psychology, Ohio State University, Columbus, Ohio, USA



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OPEN ACCESS Freely available online PLOS | ONE

The Influence of Childhood Aerobic Fitness on Learning and Memory

Lauren B. Raine[1], Hyun Kyu Lee[2], Brian J. Saliba[1], Laura Chaddock-Heyman[2], Charles H. Hillman[1*], Arthur F. Kramer[2]

1 Department of Kinesiology and Community Health, University of Illinois at Urbana - Champaign, Urbana, Illinois, United States of America, 2 The Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana - Champaign, Urbana, Illinois, United States of America

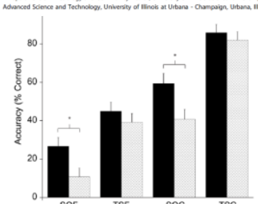

Figure 2. Response accuracy for higher fit and lower fit groups on recall day by encoding strategy. Higher fit performance is represented by the black bars, and lower fit performance is represented by the light bars. SOF represents the map learned using the study only strategy and tested with free recall; TSF represents the map learned using the test study strategy and tested with free recall; SOC represents the map learned using the study only strategy and tested using cued recall; TSC represents the map learned in the test study strategy and tested using cued recall.
doi:10.1371/journal.pone.0072666.g002

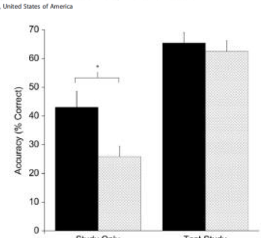

Figure 3. Recall accuracy for higher fit and lower fit groups on the map learned using the study-only strategy. Higher fit performance is represented by the black bars, and lower fit performance is represented by the light bars.
doi:10.1371/journal.pone.0072666.g003

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ScienceDirect
www.elsevier.com/locate/brainres
ELSEVIER
BRAIN RESEARCH

Research Report

A neuroimaging investigation of the association between aerobic fitness, hippocampal volume, and memory performance in preadolescent children

Laura Chaddock[a], Kirk I. Erickson[b], Ruchika Shaurya Prakash[c], Jennifer S. Kim[a], Michelle W. Voss[a], Matt VanPatter[a], Matthew B. Pontifex[d], Lauren B. Raine[d], Alex Konkel[a], Charles H. Hillman[d], Neal J. Cohen[a], Arthur F. Kramer[a,*]

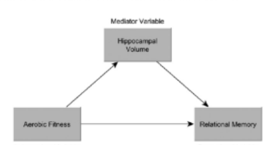

Fig. 3 – Figural representation of the mediation model. Bilateral hippocampal volume was shown to mediate the relationship between childhood aerobic fitness level (VO_2 max) and relational memory.

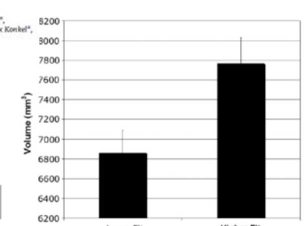

Fig. 1 – Bilateral hippocampal volume as a function of aerobi fitness group. Error bars represent standard error.

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AEROBIC FITNESS IS ASSOCIATED WITH GREATER EFFICIENCY OF THE NETWORK UNDERLYING COGNITIVE CONTROL IN PREADOLESCENT CHILDREN

M. W. VOSS,[a]* L. CHADDOCK,[a] J. S. KIM,[a] M. VANPATTER,[a] M. B. PONTIFEX,[b] L. B. RAINE,[b] N. J. COHEN,[a] C. H. HILLMAN[b] AND A. F. KRAMER[a]

[a]Beckman Institute and Department of Psychology, University of Illinois, Urbana-Champaign, IL 61801, USA

[b]Department of Kinesiology and Community Health, University of Illinois, Urbana-Champaign, IL 61801, USA

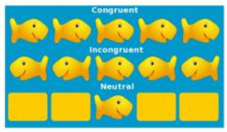

Fig. 1. Example task stimuli for a response indicating central target stimulus is pointing to the right. For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.

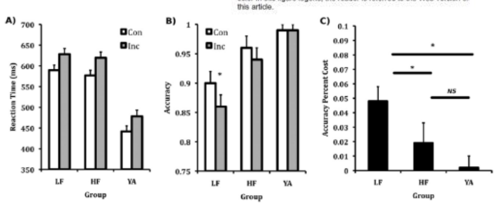

Fig. 2. (A) Main effect of condition for reaction time, (B) LF children showed greater cost specifically for the incongruent condition, * $P<.05$ as tested by independent samples t-test, (C) accuracy percent cost, * $P<.05$, NS=$P<.05$, as tested by Mann–Whitney non-parametric test.

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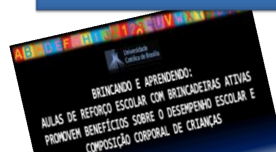
BRINCANDO E APRENDENDO



GRA

GRP

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SCIENCE AND SOCIETY

Be smart, exercise your heart: exercise effects on brain and cognition

Charles H. Hillman, Kirk I. Erickson and Arthur F. Kramer

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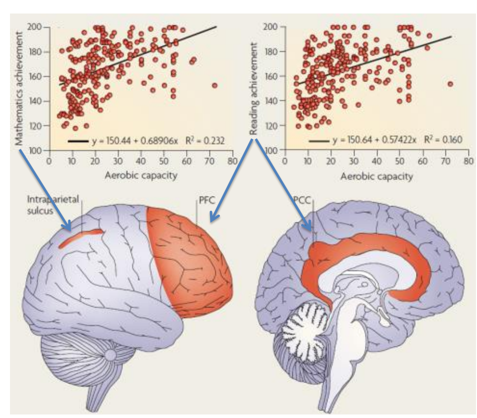

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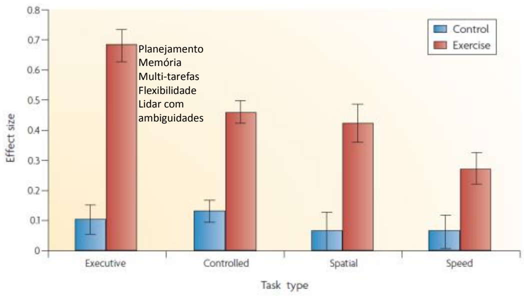

Figure 1 | **Meta-analytic findings of exercise-training effects on cognition in older adults.** The results of a meta-analysis of the effects of fitness training on cognition showed that the benefits of fitness training on four different cognitive tasks were significant. As illustrated in the figure, fitness training has both broad and specific effects. The effects are broad in the sense that individuals in aerobic fitness training groups (represented by the red bars) showed larger fitness training effects across the different categories of cognitive processes illustrated on the x-axis. They are specific in the sense that fitness training effects were larger for some cognitive processes, in particular executive control processes, than for other cognitive processes. Figure reproduced, with permission, from REF. 32 © (2003) Blackwell Publishers.

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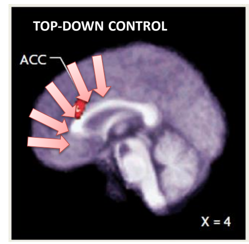

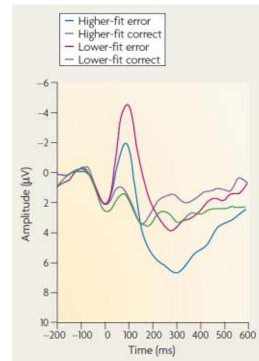

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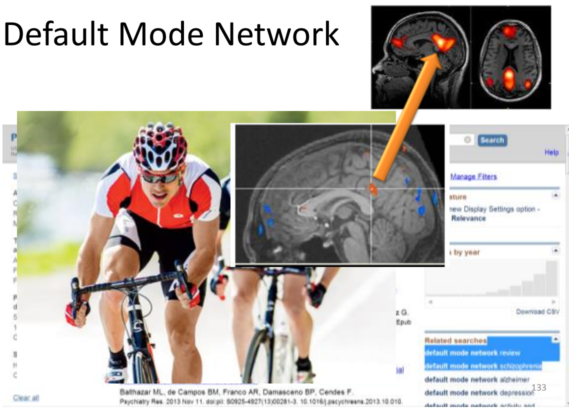
Perspectives...

Default Mode Network



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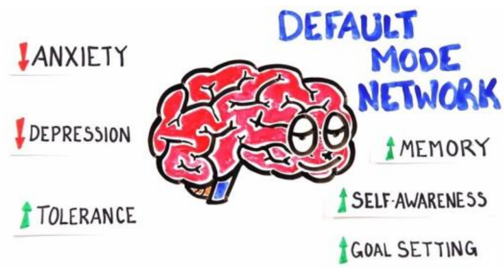

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Neuromodulação

BRAIN STIMULATION

Different electrode/coils

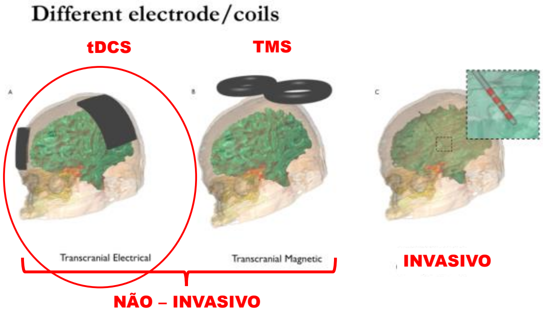
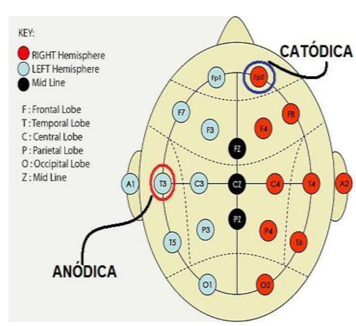
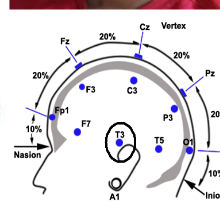


Figure from Marom Bikson

ELETRODOS – EEG Sistema 10-20





O QUE FAZ A ETCC ???

- Despolarização ou hiperpolarização
- Modificação da excitabilidade cortical

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VIAS AFERENTES DO CORTEX INSULAR

Fig. 2. Afferents to the insula. Underlined connections are described in this review. Nonunderlined connections were described in an earlier review [3].

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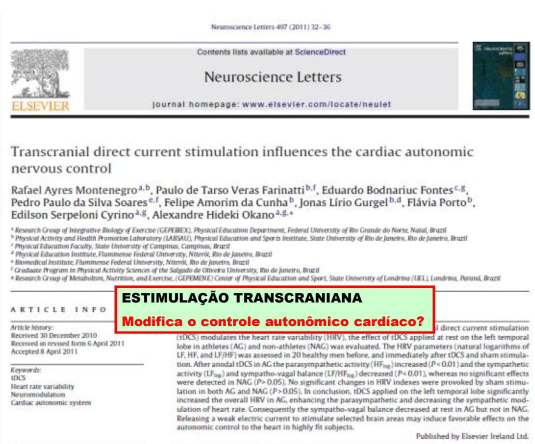

Neuroscience Letters 497 (2011) 32–36

Contents lists available at ScienceDirect

Neuroscience Letters

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

Transcranial direct current stimulation influences the cardiac autonomic nervous control

Rafael Ayres Montenegro[a,b], Paulo de Tarso Veras Farinatti[b,f], Eduardo Bodnariuc Fontes[c,g], Pedro Paulo da Silva Soares[e,f], Felipe Amorim da Cunha[b], Jonas Lírio Gurgel[b,d], Flávia Porto[b], Edilson Serpeloni Cyrino[a,g], Alexandre Hideki Okano[a,g,*]

[a] Research Group of Integrative Biology of Exercise (GEPEBIEX), Physical Education Department, Federal University of Rio Grande do Norte, Natal, Brazil
[b] Physical Activity and Health Promotion Laboratory (LABSAU), Physical Education and Sports Institute, State University of Rio de Janeiro, Rio de Janeiro, Brazil
[c] Physical Education Faculty, State University of Campinas, Campinas, Brazil
[d] Physical Education Institute, Fluminense Federal University, Niterói, Rio de Janeiro, Brazil
[e] Biomedical Institute, Fluminense Federal University, Niterói, Rio de Janeiro, Brazil
[f] Graduate Program in Physical Activity Sciences of the Salgado de Oliveira University, Rio de Janeiro, Brazil
[g] Research Group of Metabolism, Nutrition, and Exercise, (GEPEMENE) Center of Physical Education and Sport, State University of Londrina (UEL), Londrina, Paraná, Brazil

ESTIMULAÇÃO TRANSCRANIANA

Modifica o controle autonômico cardíaco?

ARTICLE INFO

Article history:
Received 30 December 2010
Received in revised form 6 April 2011
Accepted 8 April 2011

Keywords:
tDCS
Heart rate variability
Neuromodulation
Cardiac autonomic system

[...] direct current stimulation (tDCS) modulates the heart rate variability (HRV), the effect of tDCS applied at rest on the left temporal lobe in athletes (AG) and non-athletes (NAG) was evaluated. The HRV parameters (natural logarithms of LF, HF, and LF/HF) was assessed in 20 healthy men before, and immediately after tDCS and sham stimulation. After anodal tDCS in AG the parasympathetic activity (HF_{log}) increased ($P < 0.01$) and the sympathetic activity (LF_{log}) and sympatho-vagal balance (LF/HF_{log}) decreased ($P < 0.01$), whereas no significant effects were detected in NAG ($P > 0.05$). No significant changes in HRV indexes were provoked by sham stimulation in both AG and NAG ($P > 0.05$). In conclusion, tDCS applied on the left temporal lobe significantly increased the overall HRV in AG, enhancing the parasympathetic and decreasing the sympathetic modulation of heart rate. Consequently the sympatho-vagal balance decreased at rest in AG but not in NAG. Releasing a weak electric current to stimulate selected brain areas may induce favorable effects on the autonomic control to the heart in highly fit subjects.

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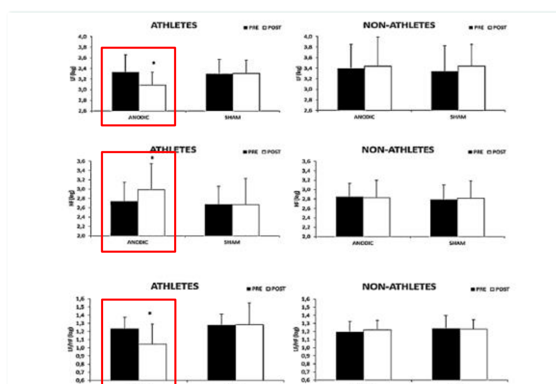

Fig. 1. Mean (SD) for HRV components of low frequency (LF_{log}), high frequency (HF_{log}), and sympathetic-vagal balance (LF/HF_{log}) during anodic and sham condition in athletes and non-athletes. *Significant difference from PRE ($P < 0.001$).

BJSM Online First, published on February 27, 2013 as 10.1136/bjsports-2012-091658

Original article

Brain stimulation modulates the autonomic nervous system, rating of perceived exertion and performance during maximal exercise

Alexandre Hideki Okano,[1] Eduardo Bodnariuc Fontes,[2] Rafael Ayres Montenegro,[3] Paulo de Tarso Veras Farinatti,[3] Edilson Serpeloni Cyrino,[4] Li Min Li,[2] Marom Bikson,[5] Timothy David Noakes[6]

► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.1136/bjsports-2012-091658).

[1]Physical Education Department, Federal University of Rio Grande do Norte (UFRN), Natal, Rio Grande do Norte, Brazil
[2]Department of Neurology, University of Campinas (UNICAMP), Campinas, São Paulo, Brazil
[3]Physical Education and Sports Institute, Rio de Janeiro State University (UERJ), Rio de Janeiro, RJ, Brazil
[4]Center of Physical Education and Sport, State University of Londrina (UEL), Londrina, Parana, Brazil
[5]Department of Biomedical Engineering, The City College of New York of CUNY, New York, New York, USA
[6]MRC/UCT Research Unit for Exercise Science and Sports Medicine, University of Cape Town (UCT), Cape Town, Western Cape, South Africa

Correspondence to
Professor Alexandre Hideki Okano, Departamento de Educação Física, Universidade Federal do Rio Grande do Norte, Campus Universitário BR 101, Lagoa Nova, CEP 59072-970, Natal, Rio Grande do Norte, Brazil; emaildookano@gmail.com

Received 6 August 2012
Revised 22 October 2012
Accepted 30 January 2013

ABSTRACT

Background The temporal and insular cortex (TC, IC) have been associated with autonomic nervous system (ANS) control and the awareness of emotional feelings from the body. Evidence shows that the ANS and rating of perceived exertion (RPE) regulate exercise performance. Non-invasive brain stimulation can modulate the cortical area directly beneath the electrode related to ANS and RPE, but it could also affect subcortical areas by connection within the cortico-cortical neural networks. This study evaluated the effects of transcranial direct current stimulation (tDCS) over the TC on the ANS, RPE and performance during a maximal dynamic exercise.

Methods Ten trained cyclists participated in this study (33±9 years; 171.5±5.8 cm; 72.8±9.5 kg; 10–11 training years). After 20-min of receiving either anodal tDCS applied over the left TC (T3) or sham stimulation, subjects completed a maximal incremental cycling exercise test. RPE, heart rate (HR) and R–R intervals (as a measure of ANS function) were recorded continuously throughout the tests. Peak power output (PPO) was recorded at the end of the tests.

Results With anodal tDCS, PPO improved by ~4% (anodal tDCS: 313.2±29.9 vs 301.0±19.8 watts: sham tDCS; p=0.043), parasympathetic vagal withdrawal was delayed (anodal tDCS: 147.5±53.3 vs 125.0±35.4 watts: sham tDCS; p=0.041) and HR was reduced at submaximal workloads. RPE also increased more slowly during exercise following anodal tDCS application, but maximal RPE and HR values were not affected by cortical stimulation.

Conclusions The findings suggest that non-invasive brain stimulation over the TC modulates the ANS activity and the sensory perception of effort and exercise performance, indicating that the brain plays a crucial role in the exercise performance regulation.

Non-invasive brain stimulation has been increasingly used by clinicians and neuroscientists to deliberately alter the status of the human brain. Transcranial direct current stimulation (tDCS) is considered a neuromodulatory intervention that induces excitability changes in the human motor cortex.[14 15] The exposed tissue is polarised, and tDCS modifies spontaneous neuronal excitability and activity by a tonic depolarisation or hyperpolarisation of resting membrane potential.[16] The nature of these modulations depends on stimulation polarity: Anodal stimulation increases excitability, which is decreased by cathodal stimulation.[17] If the stimulation is applied for 9 min or longer, these changes in excitability may persist for an hour or more.[15]

A possible mechanism underlying the tDCS effects might be associated changes in cortical neuronal activity. Pharmacological studies have shown that tDCS-related effects depend on changes of N-methyl-D-aspartate (NMDA) receptor-efficacy.[17] Using magnetic resonance spectroscopy, Stagg et al[18] demonstrated changes in gamma-aminobutyric acid (GABA) levels after anodal tDCS, suggesting that this stimulation alters both GABAnergic inhibition as well as the NMDA receptors. Although tDCS stimulates the cortical area directly beneath the electrode, it could also modulate subcortical structures since there are connections within the cortico-cortical neural networks.[19 20] It has already been shown that tDCS can improve implicit motor learning,[21] motor performance[22 23] and may be valuable in the treatment of depression,[24] of the symptoms of Alzheimer's[25] and Parkinson's disease,[26] chronic pain,[27] stroke[28] and regulation of appetite sensations.[29] Even though tDCS is an attractive, non-invasive neuromodulatory technique for a diverse range of applications, its effect on the dynamic motor performance and tolerance to physical strain has yet to be studied.

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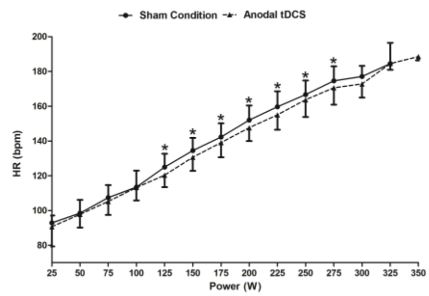
RESULTADOS



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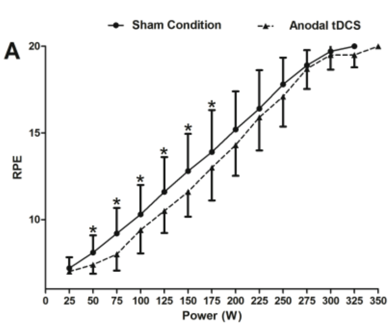
PERCEPÇÃO DE ESFORÇO



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Estimulação cerebral na promoção da saúde e melhoria do desempenho físico

CDD. 20.ed. 796.022

Alexandre Hideki OKANO*
Rafael Ayres MONTENEGRO**
Paulo de Tarso Veras FARINATTI**
Li Min LI***
André Russowsky BRUNONI****/*****
Eduardo Bodnariuc FONTES***

*Departamento de Educação Física, Universidade Federal do Rio Grande do Norte.
**Instituto de Educação Física e Desportos, Universidade do Estado do Rio de Janeiro.
***Departamento de Neurologia, Universidade Estadual de Campinas.
****Hospital Universitário, Universidade de São Paulo.
*****Faculdade de Medicina, Universidade de São Paulo.

Resumo

O avanço tecnológico das últimas décadas tem proporcionado o uso eficaz de técnicas não-invasivas na neuromodulação cerebral. Atualmente, as principais técnicas de neuromodulação são a estimulação magnética transcraniana (EMT) e a estimulação transcraniana por corrente contínua (ETCC). Por meio de revisão da literatura, o presente estudo aborda: a) história da estimulação cerebral; b) mecanismos de ação estudados através da neurofisiologia motora, farmacologia, neuroimagem e animais experimentais; c) perspectivas de aplicações da estimulação cerebral para promoção da saúde e melhoria do desempenho físico, incluindo o controle autonômico cardíaco e hipotensão pós-exercício, o controle de apetite e a modulação da fadiga e desempenho físico; e d) aspectos de segurança referentes ao uso da ETCC. Dessa forma, a ETCC parece ser uma técnica efetiva e segura para modular a função cerebral e podemos vislumbrar algumas perspectivas de aplicação no âmbito da ingestão alimentar, saúde cardiovascular e desempenho físico.

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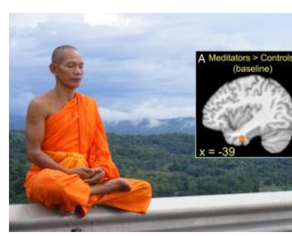
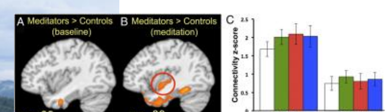
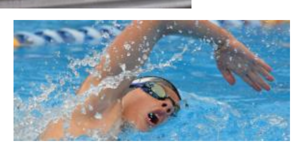
Domingo - Prática

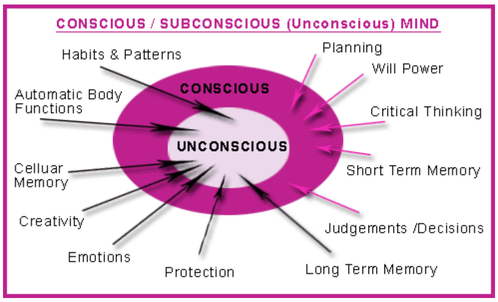
Meditação

- Mindfulness is a way of being aware.
- Mindfulness means paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally.
- Mindfulness is awareness of present experience with acceptance.









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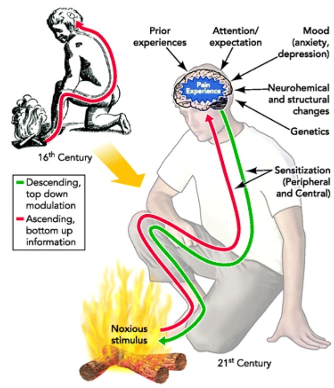

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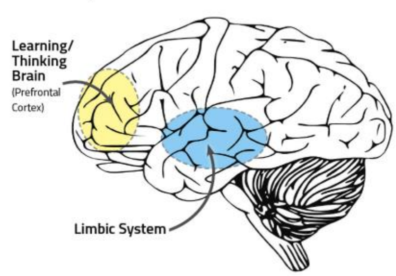
Survival Mode: Flight/Fight/Freeze

Frontal lobe (Prefrontal cortex) goes offline
Limbic system / mind and lower brain functions take over



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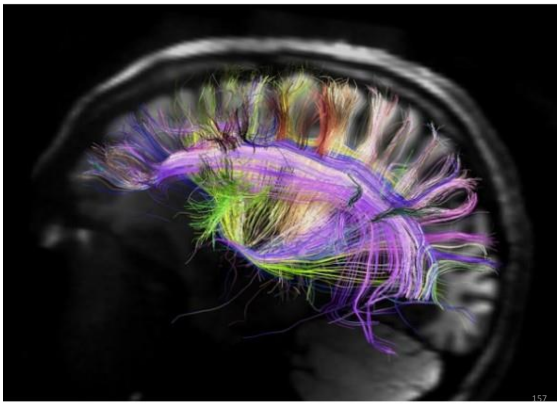

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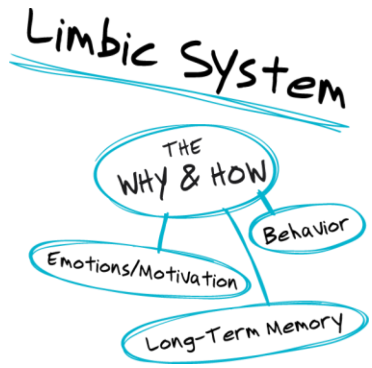

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NEOCORTEX

Meaning / Beliefs / Identifications / Self Talk

LIMBIC

Affect / Emotion

BRAIN STEM

Sensation / Felt Sense / Body Experience

LaPierre & Heller 2012; Tronick & Beeghly 2011

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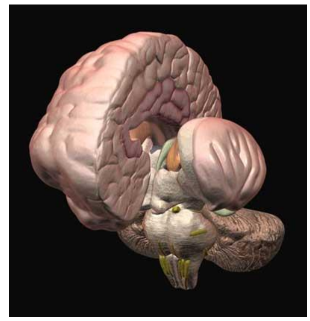

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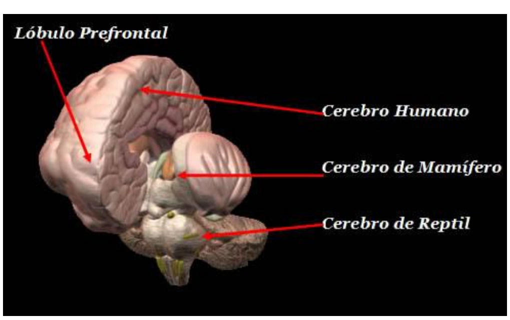

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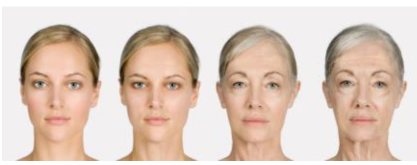
Envelhecimento e Saúde Mental



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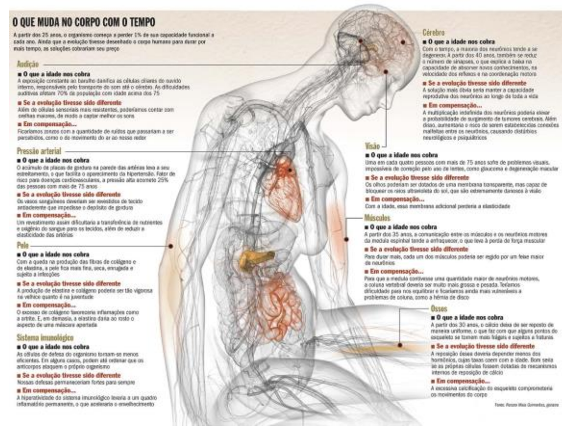

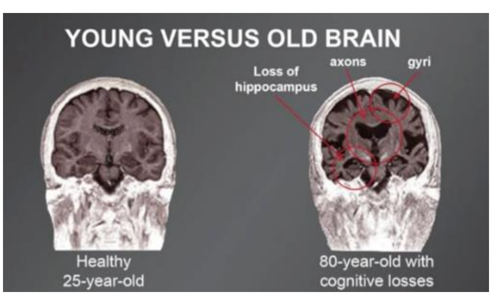

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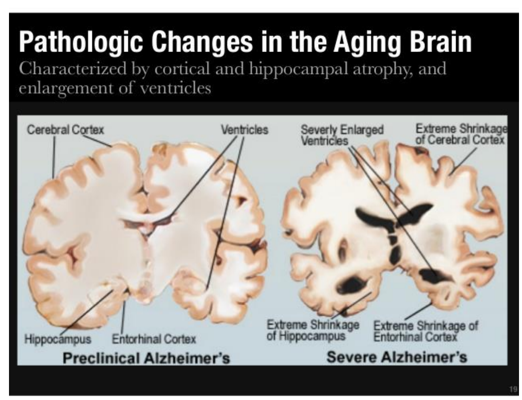

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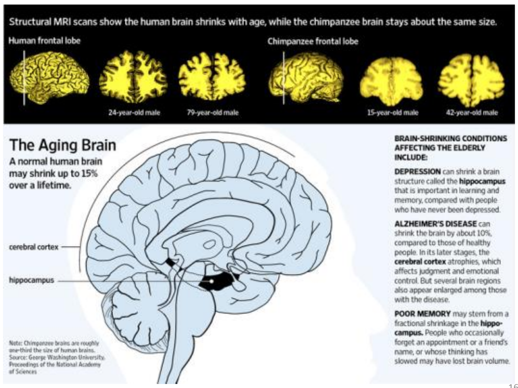

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Exercise: An Active Route to Healthy Aging

Aerobic Exercise Training Increases Brain Volume in Aging Humans

Stanley J. Colcombe,[1] Kirk I. Erickson,[1] Paige E. Scalf,[1] Jenny S. Kim,[1] Ruchika Prakash,[1] Edward McAuley,[2] Steriani Elavsky,[2] David X. Marquez,[2] Liang Hu,[2] and Arthur F. Kramer[1]

[1]Beckman Institute & Department of Psychology and [2]Department of Kinesiology, University of Illinois, Urbana.

Journal of Gerontology: MEDICAL SCIENCES
2006, Vol. 61A, No. 11, 1166–1170

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Programa de treino

- Grupo I
  - Atividade aeróbia
    - 40%-50% FC e aumenta para 60% - 70% FC no decorrer do curso
    - 3x/semana/ 1 hora
    - VO2 pico
- Grupo II
  - Atividade de alongamento e tônus muscular
    - Exercícios de alongamento e tônus para todo o corpo
    - Dificuldade descente no decorrer do programa

Todos os participantes tiveram no mínino 85% de frequência

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Table 1. Demographic Information on Aerobic Exercising and Nonaerobic Exercising Control Older Adults

Measured Variable	Exercise	Control	*t* Test
Initial VO_2	23.3 (2.4)	23.6 (2.7)	$t(58) < 1$, NS
Change in VO_2	16.1% (1.9)	5.3% (1.3)	$t(58) = 2.05$, $p < .025$
Age	65.5 y	66.9 y	$t(58) < 1$, NS
Sex	53% women	57% women	$t(58) < 1$, NS
Education	13.5 y	14 y	$t(58) < 1$, NS
MMSE	29 (1.2)	29.4 (1.4)	$t(58) < 1$, NS
Hypertensive	30%	26.7%	$t(58) < 1$, NS
HRT (women)	43.3%	53.3%	$t(58) < 1$, NS

Notes: All values except the change in VO_2 outcome represent participant characteristics at the onset of study participation.

HRT includes participant's self-report of either opposed or unopposed estrogen therapy, and participants included in the hypertensive category were those who were diagnosed as hypertensive prior to their participation in the study.

Standard errors are in parentheses.

MMSE = Mini-Mental State Examination score; NS = not significant; HRT = hormone replacement therapy.

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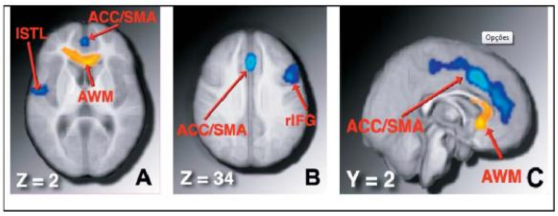

Figure 1. Regions showing a significant increase in volume for older adults who participated in an aerobic fitness training program, compared to nonaerobic (stretching and toning) control older adults. **A** and **B,** Neurologically oriented axial slices through the brain, at +2 and +34 mm, respectively, in stereotaxic space. **C,** Sagittal slice 2 mm to the right of the midline of the brain. *Blue regions:* Gray matter volume was increased for aerobic exercisers, relative to nonaerobic controls. *Yellow regions:* White matter volume was increased for aerobic exercisers, relative to controls. (See also Table 2.)

Note: ACC/SMA = anterior cingulate cortex, supplementary motor cortex; rIFG = right inferior frontal gyrus; ISTL = left superior temporal gyrus; AWM = anterior white matter.

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Exercise training increases size of hippocampus and improves memory

Kirk I. Erickson[a], Michelle W. Voss[b,c], Ruchika Shaurya Prakash[d], Chandramallika Basak[e], Amanda Szabo[f], Laura Chaddock[b,c], Jennifer S. Kim[b], Susie Heo[b,c], Heloisa Alves[b,c], Siobhan M. White[f], Thomas R. Wojcicki[f], Emily Mailey[f], Victoria J. Vieira[f], Stephen A. Martin[f], Brandt D. Pence[f], Jeffrey A. Woods[f], Edward McAuley[b,f], and Arthur F. Kramer[b,c,1]

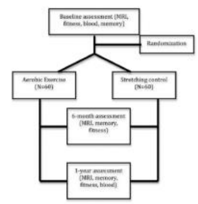
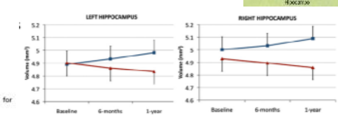


Fig. 4. Flow diagram for the randomization and assessment sessions for both exercise and stretching control groups.

Hippocampus



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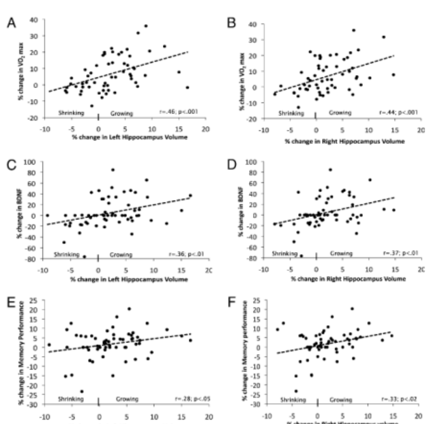

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Cognição Superior e Memória

J Appl Physiol 111: 1505–1513, 2011.
First published April 28, 2011; doi:10.1152/japplphysiol.00210.2011.

Review

HIGHLIGHTED TOPIC | *Physiology and Pathophysiology of Physical Inactivity*

Exercise, brain, and cognition across the life span

Michelle W. Voss,[1,2] Lindsay S. Nagamatsu,[3,4,5,6] Teresa Liu-Ambrose,[3,4,5] and Arthur F. Kramer[1,2]

[1]The Beckman Institute and Department of Psychology, University of Illinois at Urbana-Champaign, Urbana; [2]Department of Psychology, University of Illinois at Urbana-Champaign, Champaign, Illinois; [3]The Brain Research Centre and the [4]Department of Physical Therapy, University of British Columbia, Vancouver, British Columbia; [5]The Centre for Hip Health and Mobility, Vancouver Coastal Health Research Institute, Vancouver, British Columbia; and [6]Department of Psychology, University of British Columbia, Vancouver, British Columbia, Canada

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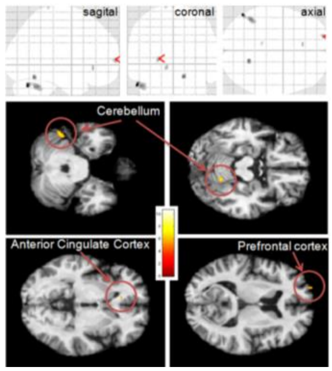
EFFECTS OF RESISTANCE TRAINING IN GRAY MATTER DENSITY IN ELDERLY

Eduardo Fontes, Cleiton Libardi, Gabriela Castellano; Alexandre Okano; Paula Teixeira, Mara Patricia Chakon-Mikahil, Carlos Ugrinowitsch, Claudia Cavaglieri, Li Li Min

In preparation



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Efeito protetor do exercício sobre o cérebro

J Neural Transm (2009) 116:777–784
DOI 10.1007/s00702-008-0092-x

BIOLOGICAL PSYCHIATRY - REVIEW ARTICLE

Physical activity, exercise, depression and anxiety disorders

Andreas Ströhle

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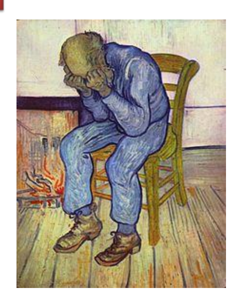
Depressão



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Depressão

- Caracteriza-se pela perda de prazer nas atividades diárias, apatia,
- alterações cognitivas (diminuição da capacidade de raciocinar adequadamente, de se concentrar ou/e de tomar decisões),
- psicomotoras (lentidão, fadiga e sensação de fraqueza),
- alterações do sono (mais frequentemente insônia, podendo ocorrer também hipersonolência),
- alterações do apetite (mais comumente perda do apetite, podendo ocorrer também aumento do apetite),
- redução do interesse sexual,
- retraimento social,
- ideação suicida e
- prejuízo funcional significativo (como faltar muito ao trabalho ou piorar o desempenho escolar).

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- 15 a 20% da população mundial
- idade entre 24 e 44 anos

- motivo pode ser dada a crianças e adolescentes como separação dos pais, problemas na escola, sexualidade, rejeição e principalmente Bullying.

- Um acontecimento estressante pode ser o fator precipitante da doença.

182

- Alterações nos níveis de neurotransmissores (serotonina, acetilcolina, dopamina, adrenalina e noradrenalina)

- atrofias em certas áreas do cérebro (particularmente no lobo pré-frontal) responsáveis pelo controle das emoções e produção de serotonin.

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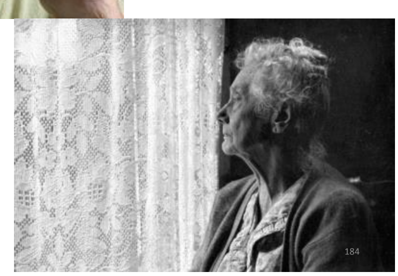

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- Exercício físico crônico promove redução de sintomas de depressão (Blumenthal et al. 1989; DiLorenzo et al.1999; Roth and Holmes 1987; King et al. 1993)
- Duração mínima de 9 semanas para eficácia comprovada (Craft & Landers 1998)
- Taxa de eficácia de 67–74% dos sujeitos.
- Eficácia em pacientes com depressão severa ainda é contraditória.
- Maioria dos estudos utilizaram exercícios aeróbios, mas alguns mostram a eficácia de treinamento com pesos também (Singh et al. 1997 e Doyne et al. 1987)

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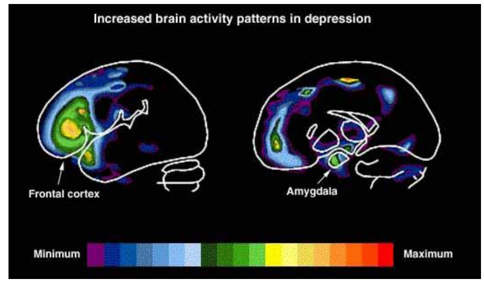

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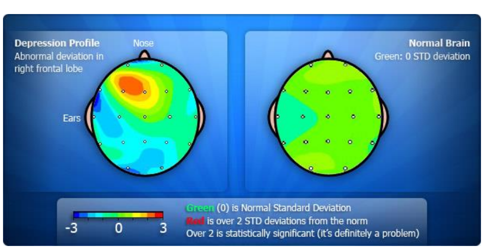

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Journal of Affective Disorders 140 (2012) 300–305

Contents lists available at SciVerse ScienceDirect

Journal of Affective Disorders

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

Preliminary communication

Interacting with nature improves cognition and affect for individuals with depression

Marc G. Berman [a,b,*], Ethan Kross [b], Katherine M. Krpan [b], Mary K. Askren [b], Aleah Burson [b], Patricia J. Deldin [b], Stephen Kaplan [b], Lindsey Sherdell [c], Ian H. Gotlib [c], John Jonides [b]

[a] Rotman Research Institute at Baycrest, Canada
[b] University of Michigan, United States
[c] Stanford University, United States

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Ansiedade

- aflição, angústia, perturbação do espírito causada pela incerteza, relação com qualquer contexto de perigo, entre outros.
- A ansiedade estimula o indivíduo a entrar em ação, porém, em excesso, faz exatamente o contrário, impedindo reações.

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Sintomas de Ansiedade

- Preocupações, tensões ou medos exagerados (a pessoa não consegue relaxar)
- Sensação contínua de que um desastre ou algo muito ruim vai acontecer
- Preocupações exageradas com saúde, dinheiro, família ou trabalho
- Medo extremo de algum objeto ou situação em particular
- Medo exagerado de ser humilhado publicamente
- Falta de controle sobre pensamentos, imagens ou atitudes, que se repetem independentemente da vontade
- Pavor depois de uma situação muito difícil.

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- Estudos apontam por eficácia no tratamento da ansiedade com exercício físico agudo e crônico. (Long and Satvel 1995, Orwin 1974; Muller and Armstrong 1975)
- Exercício pode causar ataques de pânico em pacientes severos. (Broocks et al. 1998; Barlow and Craske 1994) No entanto há contradição: (Strohle et al. 2005; Esquivel et al. 2002)

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- Redução moderada dos sintomas de ansiedade com exercício físico. (Petruzzello et al. 1991).
- Pacientes com sintomas severos de ansiedade, o exercício aeróbio foi mais eficaz do que treinamento com pesos e alongamento. (Steptoe et al. 1989)
- Eficiência do exercício físico aeróbio também é encontrada em pacientes com ataques de pânico (Manger 2000; Manger and Motta 2005).

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Epilepsia

- é um grupo de transtornos neurológicos de longa duração caracterizados por ataques epilépticos.
- Estes ataques são episódios de duração e intensidade variável, desde os de curta duração e praticamente imperceptíveis até longos períodos de agitação vigorosa.
- Seizures can disrupt any function the brain controls – **movement, thoughts, sensations, behaviour, and the person's level of consciousness**.

Sintomas

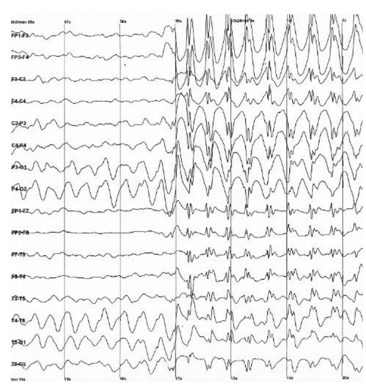
- Esquecimento súbito;
- Desmaios;
- Distúrbios do movimento
- Distúrbios de sensações (incluindo visão, audição e paladar)
- Distúrbios de humor (como depressão e ansiedade)
- Distúrbios de função cognitiva.
- É também comum que os episódios de convulsões resultem em ferimentos e dificuldades de socialização.

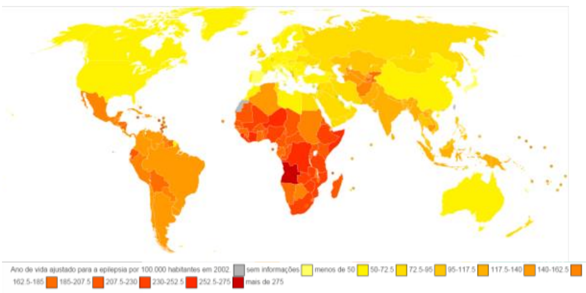
Causas

Lesão em neurônios ou o modo como estes se comunicam entre si.

Os mais frequentes são:

- traumatismos cranianos, provocando cicatrizes cerebrais;
- traumatismos de parto;
- certas drogas ou tóxicos;
- interrupção do fluxo sanguíneo cerebral causado por acidente vascular cerebral ou problemas cardiovasculares;
- doenças infecciosas ou tumores.





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Características

- Cerca de 50 milhões de pessoas no mundo sofrem de epilepsia, e quase 90% delas ocorrem em países em desenvolvimento.
- A epilepsia se torna mais comum com a idade.
- O início de novos casos ocorrem na maioria das vezes em crianças e idosos.
- Como consequência de uma cirurgia cerebral, crises epilépticas podem ocorrer em pacientes em recuperação.
- A epilepsia possui tratamento, mas não é curada com a medicação. Contudo, cerca de 30% das pessoas com epilepsia não têm o controle das crises mesmo com os melhores medicamentos disponíveis.
- Cirurgia pode ser considerada em casos em que medicação não seja eficiente ou os efeitos colaterais sejam muito incômodos.
- Não deve ser entendida como uma doença única.

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- Não se deve colocar a mão ou algum objeto na boca, ao invés disso deve se procurar afrouxar suas roupas e evitar que a pessoa se golpeie ou se machuque. Pode-se colocar algo macio embaixo da cabeça e contê-la gentilmente até que a crise finalize.

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Crises epiléticas

- Enrijecimento do corpo;
- Grunhidos;
- Virar olhos e cabeça;
- Movimentação dos braços e pernas;
- Salivação espumosa.

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Crises parciais

- Tremores na face, membros ou espalhados pelo corpo;
- Distúrbios sensoriais como alucinação visual, auditiva, tátil ou palato-olfativa;
- Mudança de humor, perda de memória e pensamento;
- Mal estar, palpitação, salivação, suor, ou rubor na face;
- Enformigamento da boca, e das mãos.

Os sintomas sentidos dependem da área do cérebro afetada.

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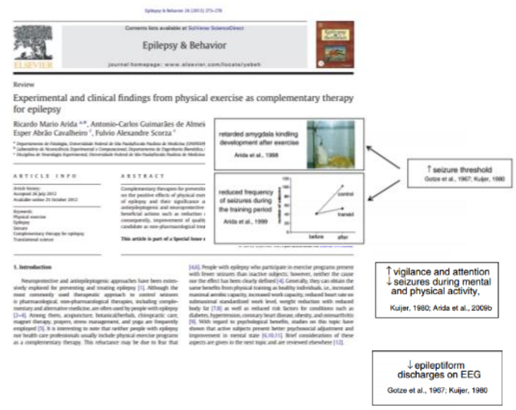

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Esclerose Multipla

- reação inflamatória na qual são danificadas as bainhas de mielina que envolvem os axónios dos neurónios cerebrais e medulares, levando à sua desmielinização e ao aparecimento de um vasto quadro de sinais e sintomas.
- A doença manifesta-se geralmente em jovens adultos e é mais frequente em mulheres numa razão de cerca de 3:1.

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Características

- Devido a esta desmielinização, a EM afeta a capacidade das células nervosas do cérebro e da medula espinhal comunicarem entre si de forma eficaz.
- o próprio sistema imune do corpo ataca e destrói a mielina
- O termo "esclerose múltipla" é uma referência às lesões, ou escleroses, que ocorrem sobretudo na substância branca do cérebro, cerebelo e medula espinal, que é constituída principalmente por fibras nervosas revestidas de mielina.

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- Embora sejam plenamente conhecidos os mecanismos envolvidos no desenvolvimento da doença, a causa é ainda desconhecida. As teorias plausíveis inclinam-se para uma causa genética,infecciosa ou muito provavelmente imunológica.

- perda de capacidades físicas e cognitivas

- A expectativa de vida em doentes de EM é de cerca de cinco a dez anos inferior à restante população.[1]

Causas

- Genética
- Fatores ambientais
- Infecções
- Anomalias vasculares

Sintomas

- Centrais – Cansaço, depressão, humor alterado
- Visão
- Motores
- Sensorial
- Intestinal
- Urinário

Mult Scler. 2008 Jan;14(1):35-53. Epub 2007 Sep 19.

Multiple sclerosis and physical exercise: recommendations for the application of resistance-, endurance- and combined training.

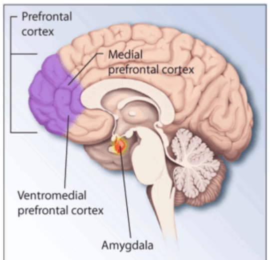
Dalgas U[1], Stenager E, Ingemann-Hansen T.

⊕ **Author information**

Abstract

This review summarizes the existing knowledge regarding the effects of physical exercise in patients suffering from multiple sclerosis (MS). Furthermore, recommendations are given regarding exercise prescription for MS patients and for future study directions. Previously, MS patients were advised not to participate in physical exercise. During recent years, it has been increasingly acknowledged that exercise benefits MS patients. The requirement for exercise in MS patients is emphasized by their physiological profile, which probably reflects both the effects of the disease per se and the reversible effects of an inactive lifestyle. To date the effects of exercise have only been studied in moderately impaired MS patients with an EDSS score of less than 7. Evidence exists for recommending participation in endurance training at low to moderate intensity, as the existing literature demonstrates that MS patients can both tolerate and benefit from this training modality. Also, resistance training of moderate intensity seems to be well tolerated and to have beneficial effects on MS patients, but the methodological quality of the existing evidence is in general low and the number of studies is limited. Only two studies have evaluated the effects of combined resistance- and endurance training, making solid conclusions regarding this training modality impossible.

Estresse



Brain Structures Involved in Dealing with Fear and Stress

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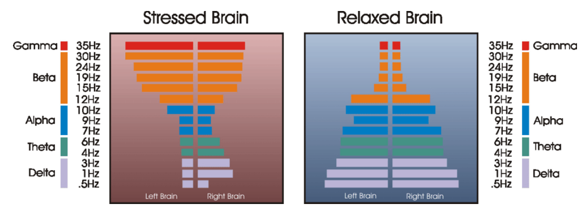

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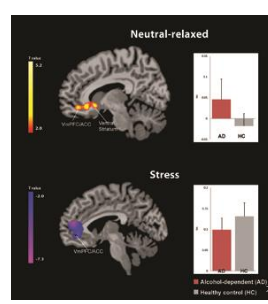

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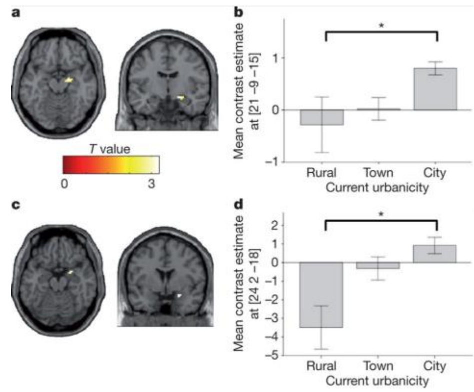

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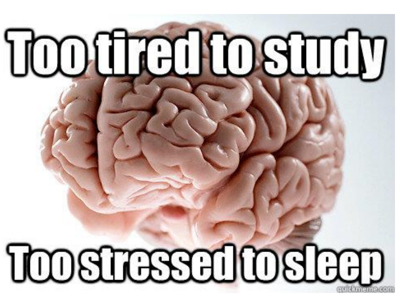

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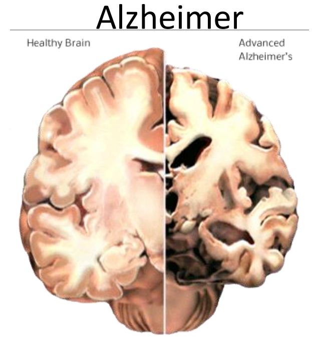
Alzheimer



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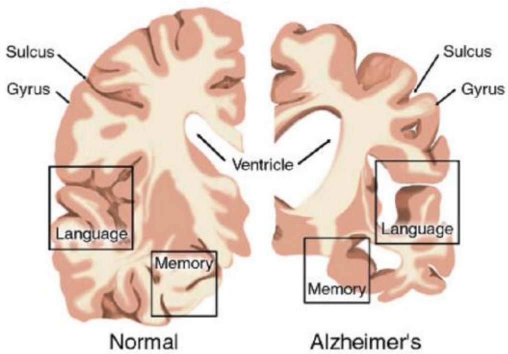

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Parkinson

Doença progressiva do movimento devido à disfunção dos neurônios secretores de dopamina nos gânglios da base, que controlam e ajustam a transmissão dos comandos conscientes vindos do córtex cerebral para os músculos do corpo humano.

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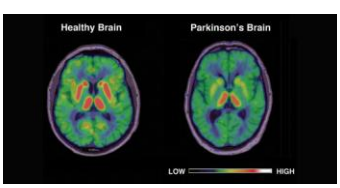

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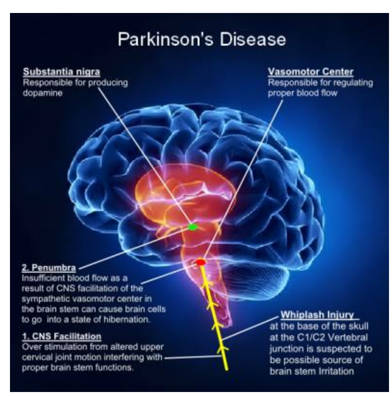

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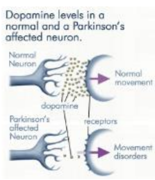

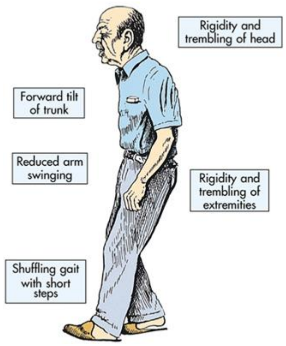

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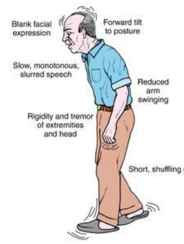

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Prazer

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PERSPECTIVES

HEMISFÉRIO ESQUERDO: "HAPPY SIDE"

OPINION

How do you feel — now? The anterior insula and human awareness

A. D. (Bud) Craig

Abstract | The anterior insular cortex (AIC) is implicated in a wide range of conditions and behaviours, from bowel distension and orgasm, to cigarette craving and maternal love, to decision making and sudden insight. Its function in the re-representation of interoception offers one possible basis for its involvement in all subjective feelings. New findings suggest a fundamental role for the AIC (and the von Economo neurons it contains) in awareness, and thus it needs to be considered as a potential neural correlate of consciousness.

Critchley *et al.* reported functional MRI (fMRI) and morphometric data indicating a specific role for the right AIC in heart-beat awareness[3], an interoceptive measure that correlates with individual subjective emotional awareness[4]. A PET study of non-painful gastric distension reported that a subjective sense of fullness was associated with activation peaks in the bilateral dorsal posterior insula, the left mid-insula, the left AIC and the ACC[5]; these results conform to the posterior-to-mid-to-anterior pattern of integration mentioned above, but the left-sided asymmetry seems to correlate with the fact that this stimulus activates primarily vagal (parasympathetic) afferents (BOX 3). Finally, activation was observed in the bilateral AIC (right side (R)>left side (L)) during non-painful oesophageal distention or view-

NATURE REVIEWS | NEUROSCIENCE VOLUME 10 | JANUARY 2009 | 59

ETCC x Consumo Alimentar

Distúrbios Alimentares
"food cravings"

Physiology & Biochemistry

Does Prefrontal Cortex Transcranial Direct Current Stimulation Influence the Oxygen Uptake at Rest and Post-exercise?

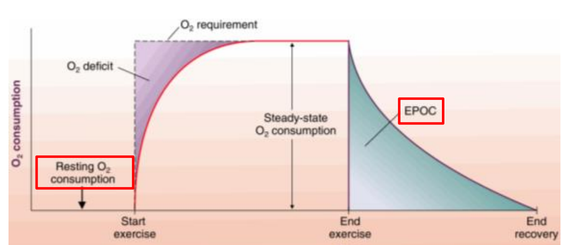
Authors R. Montenegro[1], A. H. Okano[2], F. A. Cunha[3], E. B. Fontes[4], P. Farinatti[5]
Affiliations Affiliation addresses are listed at the end of the article

Key words
- energy expenditure
- metabolism
- isocaloric exercise
- EPOC
- central nervous system
- health

Abstract

The study evaluated the effect of transcranial direct current stimulation (tDCS) applied over prefrontal cortex on the oxygen uptake ($\dot{V}O_2$) at rest and during post-exercise recovery. The $\dot{V}O_2$ was assessed in eleven healthy subjects before, during tDCS (sham or anodal tDCS, 2 mA, 20 min), and 30-min following isocaloric aerobic exercise (~200 kcal). During tDCS, no changes were observed on $\dot{V}O_2$ compared to baseline ($P=0.95$) and sham condition ($P=0.85$). The association between isocaloric exercise and anodal tDCS increased the $\dot{V}O_2$ throughout 30-min recovery compared to sham condition ($P<0.001$). Therefore, the energy expenditure within the excess post-exercise oxygen consumption (EPOC) period, after anodal tDCS was approximately 19% higher compared to the sham condition ($P<0.05$). In conclusion, anodal tDCS applied on the prefrontal cortex combined with submaximal aerobic exercise increased the EPOC, enhancing the $\dot{V}O_2$ and energy expenditure at least for 30-min of recovery.

O_2 consumption during exercise and EPOC (excess post-exercise O_2 consumption)



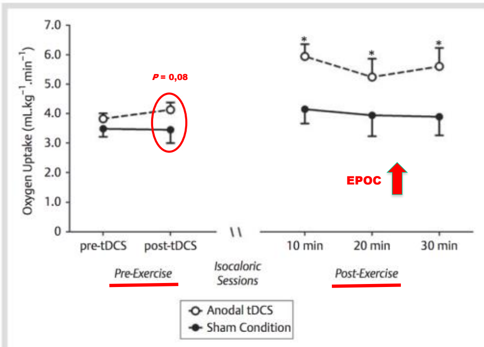


Fig. 1 Mean values of $\dot{V}O_2$ at rest and post-exercise recovery after sham and anodal tDCS. *Significant difference between sham and anodal tDCS (10 and 30 min, $P<0.001$ and 20 min, $P=0.002$).

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EXERCISE PSYCHOLOGY

Journal of Sport & Exercise Psychology, 2007, 29, 498-517

EXERCÍCIO FAZ AS PESSOAS SE SENTIREM BEM !!!

MAS PORQUE AS PESSOAS SÃO INATIVAS FISICAMENTE ???

Exercise Makes People Feel Better But People Are Inactive: Paradox or Artifact?

Susan H. Backhouse,[1] Panteleimon Ekkekakis,[2] Stuart J.H. Biddle,[3] Andrew Foskett,[4] and Clyde Williams[3]
[1]Carnegie Research Institute, Leeds Metropolitan University; [2]Iowa State University; [3]Loughborough University; [4]Massey University (Albany)

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ORIGINAL RESEARCH

Journal of Sport & Exercise Psychology, 2010, 32, 137-153

EXERCÍCIO DEVERIA SER BOM PARA MIM !!!

MAS PORQUE NÃO ME SINTO BEM QUANDO FAÇO ???

Exercise Might Be Good for Me, But I Don't Feel Good About It: Do Automatic Associations Predict Exercise Behavior?

Matthias Bluemke,[1] Ralf Brand,[2] Geoffrey Schweizer,[2] and Daniela Kahlert[2]
[1]University of Heidelberg; [2]University of Potsdam

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TEORIA HEDÔNICA DA MOTIVAÇÃO

Por outro lado, se a atividade acarreta numa sensação de desprazer, desconforto, dor ou exaustão, a probabilidade dele em repetir ou aderia àquela atividade é diminuída !!!

Quando uma atividade realizada pelo sujeito é percebida de forma prazerosa, provavelmente, ele torna a repetir tal atividade !!!

(KAHNEMAN, 1999)

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ELSEVIER

Psychology of Sport and Exercise 9 (2008) 231–245

Psychology OF SPORT AND EXERCISE

www.elsevier.com/locate/psychsport

Acute affective response to a moderate-intensity exercise stimulus predicts physical activity participation 6 and 12 months later

David M. Williams*, Shira Dunsiger, Joseph T. Ciccolo, Beth A. Lewis, Anna E. Albrecht, Bess H. Marcus

Brown Medical School and The Miriam Hospital, Centers for Behavioral and Preventive Medicine, Coro Bldg., Suite 500, One Hoppin Street, Providence, RI 02903, USA

Received 22 September 2006; received in revised form 2 April 2007; accepted 3 April 2007
Available online 10 April 2007

Existe relação entre a resposta afetiva durante exercício e aderência ao programa de treinamento?

bad) prior to and during an acute, moderate-intensity exercise stimulus presented prior to randomization in a controlled physical activity promotion trial. At 6 and 12 months, 31 of the 37 participants reported their total weekly minutes of physical activity.
Results: As hypothesized, basic affective response to the moderate-intensity stimulus predicted 6-month physical activity ($\beta = .51$, $p = .013$) when controlling for baseline physical activity and self-reported affect prior to the initial exercise stimulus, and 12-month physical activity ($\beta = .45$, $p = .047$) when also controlling for 6-month physical activity.
Conclusions: Affective response to an acute moderate-intensity exercise stimulus predicted self-reported physical activity 6 and 12 months later. The findings could have implications for prescription of exercise

Table 1
Correlations and descriptive statistics among baseline FS, baseline RPE, pre-task FS, baseline PAR, 6-month PAR and 12-month PAR

Measure	Min	Max	Mean	SD	1	2	3	4	5	6
1. FS → PRAZER	−1.00	5.00	2.24	1.52		−.35*	.49**	.32	.50**	.47**
2. RPE → ESFORÇO	7.00	19.00	11.41	2.27			−.14	.20	[illegible]**	[illegible]
3. Pre-task FS	−1.00	5.00	2.30	1.76				.33	.13	.18
4. Baseline PA min	0.00	85.00	12.64	22.94					.20	.11
5. 6-month PA min	0.00	390.00	145.74	116.91						.50**
6. 12-month PA min	0.00	600.00	131.10	141.52						

Note. FS = Feeling Scale. RPE = Rating of Perceived Exertion. PA = Physical activity of at least moderate-intensity.
*$p < .05$.
**$p < .01$.

Sujeitos com respostas positivas (de prazer) ao exercício físico agudo tendem a realizar mais tempo de exercício após 6 e 12 meses

Table 2
Two-step linear regression analysis for predicting 6-month physical activity

	Variable	*B*	*SE B*	*β*	*p*-value
Step 1	Constant	75.92	34.00		
	Baseline PA min	0.33	0.92	0.07	0.725
	Pre-Task FS	−6.98	12.30	−0.11	0.575
	FS	38.12	14.37	0.51	0.013
	Overall model fit: F (3,26) = 2.864, p = .056				

Table 3
Two-step linear regression analysis for predicting 12-month physical activity

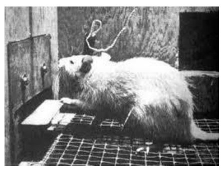
	Variable	*B*	*SE B*	*β*	*p*-value
Step 1	Constant	9.15	46.30		
	Baseline PA min	−0.66	1.09	−0.11	0.549
	6-Month PA min	0.39	0.24	0.30	0.118
	Pre-task FS	−0.07	15.55	−.001	0.997
	FS	40.97	19.48	0.45	0.047
	Overall model fit: F (4,23) = 3.563, p = .021				

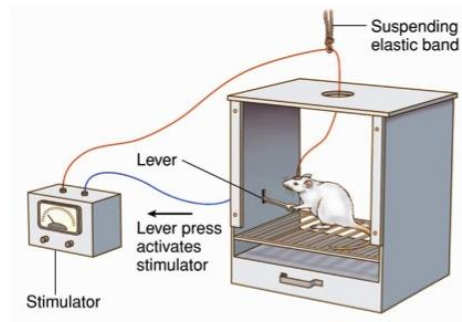
CIRCUITO NEURAL DO PRAZER

James Olds
1922-1976

Psicologia / Harvard University
Pós-Doutorado / McGill University
California Institute of Technology - Caltech

Substância reticular do mesencéfalo → **APRENDIZAGEM > ATENÇÃO**





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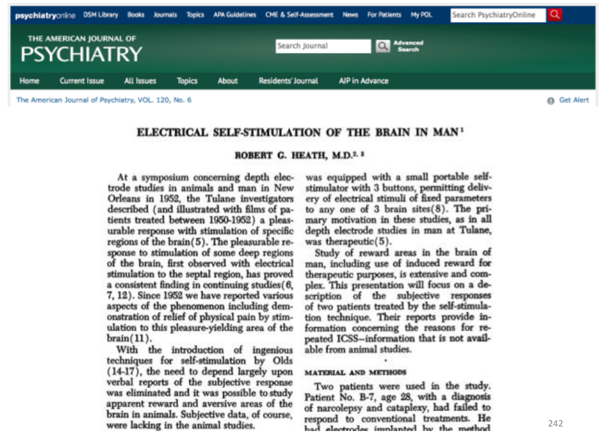
CIRCUITO NEURAL DA RECOMPENSA → **SISTEMA DOPAMINÉRGICO**

Subst eticular do éfalo → APRE AGEM > AT O



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ELECTRICAL SELF-STIMULATION OF THE BRAIN IN MAN[1]

ROBERT G. HEATH, M.D.[2, 3]

At a symposium concerning depth electrode studies in animals and man in New Orleans in 1952, the Tulane investigators described (and illustrated with films of patients treated between 1950-1952) a pleasurable response with stimulation of specific regions of the brain(5). The pleasurable response to stimulation of some deep regions of the brain, first observed with electrical stimulation to the septal region, has proved a consistent finding in continuing studies(6, 7, 12). Since 1952 we have reported various aspects of the phenomenon including demonstration of relief of physical pain by stimulation to this pleasure-yielding area of the brain(11).

With the introduction of ingenious techniques for self-stimulation by Olds (14-17), the need to depend largely upon verbal reports of the subjective response was eliminated and it was possible to study apparent reward and aversive areas of the brain in animals. Subjective data, of course, were lacking in the animal studies.

was equipped with a small portable self-stimulator with 3 buttons, permitting delivery of electrical stimuli of fixed parameters to any one of 3 brain sites(8). The primary motivation in these studies, as in all depth electrode studies in man at Tulane, was therapeutic(5).

Study of reward areas in the brain of man, including use of induced reward for therapeutic purposes, is extensive and complex. This presentation will focus on a description of the subjective responses of two patients treated by the self-stimulation technique. Their reports provide information concerning the reasons for repeated ICSS—information that is not available from animal studies.

MATERIAL AND METHODS

Two patients were used in the study. Patient No. B-7, age 28, with a diagnosis of narcolepsy and cataplexy, had failed to respond to conventional treatments. He

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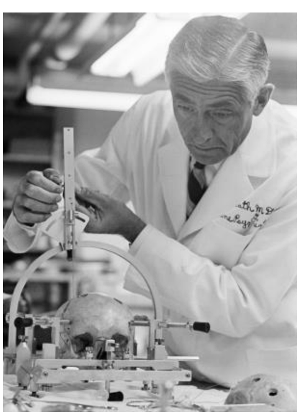

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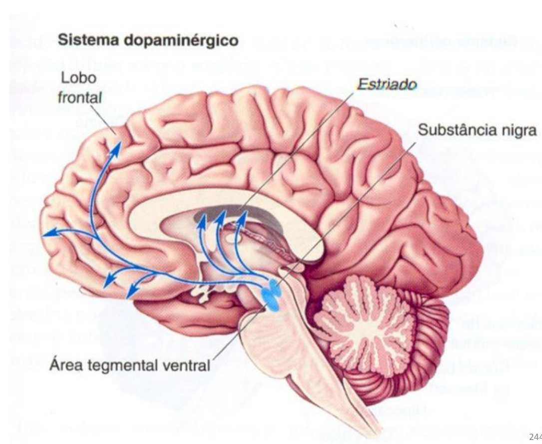

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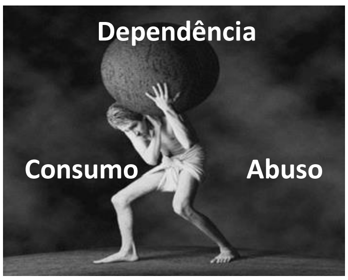
Adição: A adição é a busca compulsiva e persistente de uma substância ou atividade mesmo em face de uma crescente ameaça para a própria vida ou que seja causa de sofrimento próprio ou alheio.

David Lynden, Neurocientista.



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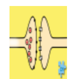
Modelo Biológico X Modelo Psicosocial

National Institute on Drug Abuse
The Science of Drug Abuse & Addiction



- Modelo de *brain disease*
- Alterações estruturais em áreas cerebrais (recompensa/prazer)
- N° de receptores (resistência)

Comportamento

Funções Executivas:
Tomada de Decisão
Inibição
Memória de trabalho
Flexibilidade

Neurocientista Carl Hart

- Modelo de *social disease*
- Menos favorecidos (excluídos), pressões sociais (sucesso, cobrança)
- Baixa auto-estima, espiritualidade, Reforço alternativo

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Perspectiva Evolutiva

Neurotransmissores

-Endocanabinóides
-Dopamina
-Endorfinas

Analgesia, Prazer, Euforia

Evoluímos com uma rotina diária de atividade física

BDNF e VEGF

Metodologia de caçada de perseguição

Corrida = Atividade Natural

Menor quantidade de Pelôs e glândulas sudoríporas

Postura bípede: Ciclo alongamento-encurtamento

Economia de Energia
Metabolismo oxidativo

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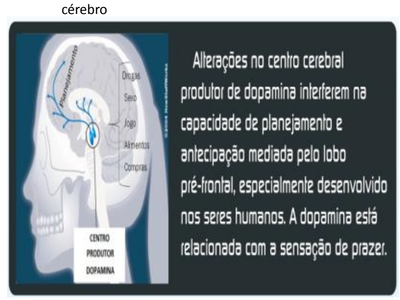
Terapia Esportiva como método de tratamento de dependência química

O abuso de determinadas substâncias ou comportamentos está associado com alterações morfológicas (físicas, materiais) relacionadas com a ação da dopamina no "circuito do prosencéfalo medial do prazer". A adição, portanto, é uma doença crônica não transmissível, sem cura, que requer reconfiguração das operações do cérebro



- Área Tegmentar Ventral
- Corpo Estriado medial
- Partes do Tálamo
- Hipocampo
- Hipotálamo
- Cortex Pré-Frontal
- Núcleo Accumbens
- Amídala

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Terapia Esportiva como método de tratamento de dependência química

Por que eu quero muito isso????

Recompensa imediata com baixo gasto energético

Recompensa é tardia após esforço devido = ↑ gasto energético

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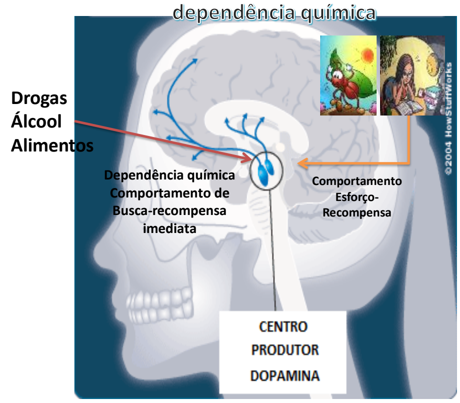
Terapia Esportiva como método de tratamento de dependência química



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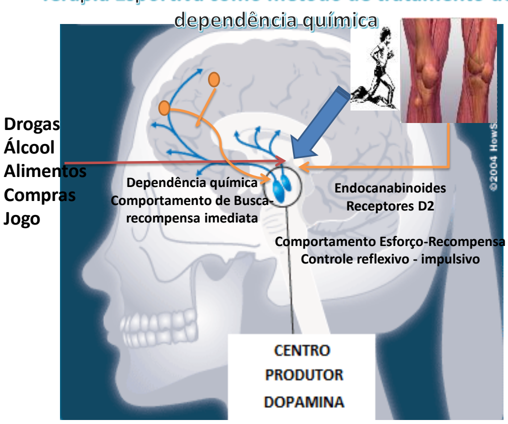
Terapia Esportiva como método de tratamento de dependência química



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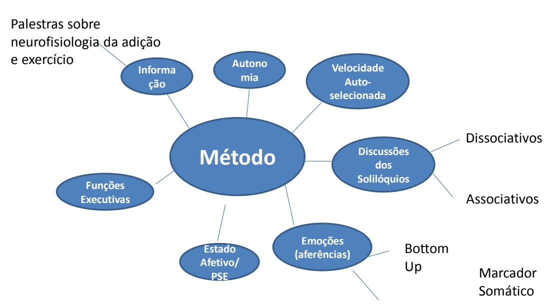
Terapia Esportiva como método de tratamento de dependência química

Através da terapia esportiva com corrida o cérebro é condicionado a reestabelecer a relação **planejamento-esforço-recompensa.**



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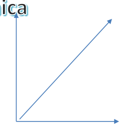
Terapia Esportiva como método de tratamento de dependência química

Continuidade: Primeiro Volume depois intensidade



Protocolo: 8 a 12 semanas/ 3 x por semana

Sessão

Preleção e esclarecimento prévio das atividades: 5 - 10 min

Aquecimento: 10 à 25 min. Inclui: Caminhada, articulações, alongamento, exercícios de técnica de corrida.

Parte principal de corrida contínua: progressão de 6 até 35 min em 8 semanas ou 50 min em 12 semanas.

Retorno à calma e diálogo sobre as percepções e sentimentos relacionados com a sessão de treinamento: 5-10 min.

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Terapia Esportiva como método de tratamento de dependência química

1° Vivência: Corrida livre: Aumentar o senso de auto-eficácia para as tarefas mais desgastantes das próximas sessões.

Primeiro contato com as emoções do exercício

Técnicas de corrida, passada, trotar, caminhar (rápido, lento)

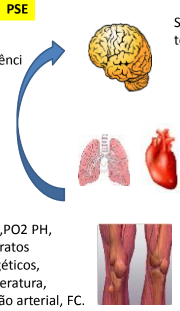
Solilóquios

"Estou sem ar"

"Minhas pernas estão queimando"

" Não consigo mais correr"

"Assim eu vou morrer"



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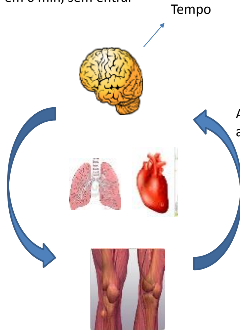
2° Distância: Correr a maior distância possível em 6 min, sem entrar em exaustão ou andar.

Auto-Selecionada

Controle de Ritmo (PSE)

Planejamento

Governador Central



-Feedback

-Pacing

-Reserve Anticipatory

-

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3° Tempo: Realizar a distância no menor tempo possível

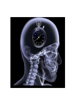
Time Trial: Teste contra relógio

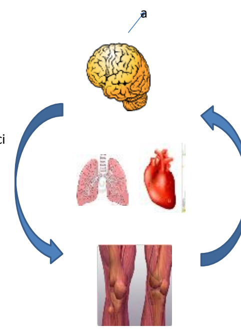
Auto-Selecionada

Planejamento

Controle de Ritmo

Governador Central





-Feedback

-Pacing

-Reserve Anticipatory

-

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Terapia Esportiva como método de tratamento de dependência química

Promovendo a aderência e autonomia na corrida

Modelo Biológico

Finalizar o tratamento

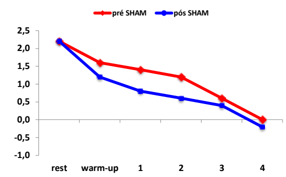
Modelo Psicosocial

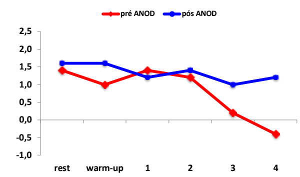



"Válvula de escape"

Estimular o Sistema Dopaminérgico


Mudança de Comportamento





+5	Muito Bom
+4	
+3	Bom
+2	
+1	Levemente Bom
0	Neutro
-1	Levemente Ruim
-2	
-3	Ruim
-4	
-5	Muito Ruim

Resultados

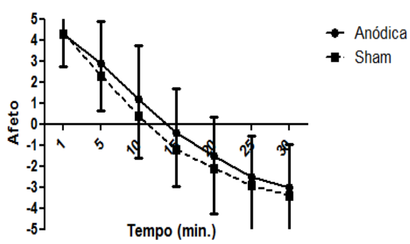


Figura 2. Percepção de afeto durante o teste retangular com intensidade a 120% do LVFC, em ambas as condições experimentais de estimulação (anódica e *sham*).

Obesidade

TEM-786; No. of Pages 11
ARTICLE IN PRESS
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Functional brain imaging of appetite

Alain Dagher

Montreal Neurological Institute, McGill University, 3801 University Street, Montreal, Quebec, H3A 2B4, Canada

Obesity is a neurobehavioral disorder that results from a combination of overeating and insufficient physical activity. Finely tuned mechanisms exist to match food intake to caloric expenditure. However, faced with abundant inexpensive and calorie-dense foods, many humans (and perhaps most) have a tendency to consume beyond their caloric needs. The brain controls food intake by sensing internal energy-balance signals and external cues of food availability, and by controlling feeding behavior; it is therefore at the centre of the obesity problem. This article reviews the recent use of functional brain imaging in humans to study the neural control of appetite, and how the neural systems involved may cause vulnerability to overeating in the obesogenic environment.

Why functional brain imaging?

The idea that the vulnerability to overeating and obesity might reside in the brain stems from multiple lines of research. Many obese individuals demonstrate enduring personality characteristics that predispose them to over-

The appetitive brain network: a neural substrate for motivated choice

Feeding requires arousal, attention to food cues, learning and memory, as well as the willingness to expend effort and take risks to obtain food. These functions are subsumed by brain regions that form a network for appetite control. This network must integrate bodily information about short- and long-term energy stores with higher-level cognitive information regarding dietary goals. The regions that are

Glossary

Allostasis: an alternative to homeostasis proposed by Sterling and Eyer [72] according to which physiological regulation crucially depends on anticipation of future needs. Whereas homeostasis refers to error-driven feedback mechanisms that maintain internal constancy, the goal of allostasis is to promote long-term survival and reproduction. Examples of allostatic control include salt-craving in anticipation of a future need to elevate blood pressure and hunger long before the occurrence of calorie deficiency. Allostasis negates the false dichotomy between hedonic and homeostatic eating because eating in response to abundant food is adaptive.

BOLD: blood oxygen level-dependent signal. The most commonly used technique in fMRI, which measures changes in cerebral blood flow that reflect neuronal activity.

PERSPECTIVES

NATURE REVIEWS | NEUROSCIENCE VOLUME 13 | APRIL 2012 | 279

OPINION

Obesity and the brain: how convincing is the addiction model?

Hisham Ziauddeen, I. Sadaf Farooqi and Paul C. Fletcher

Abstract | An increasingly influential perspective conceptualizes both obesity and overeating as a food addiction accompanied by corresponding brain changes. Because there are far-reaching implications for clinical practice and social policy if it becomes widely accepted, a critical evaluation of this model is important. We examine the current evidence for the link between addiction and obesity, identifying several fundamental shortcomings in the model, as well as weaknesses and inconsistencies in the empirical support for it from human neuroscientific research.

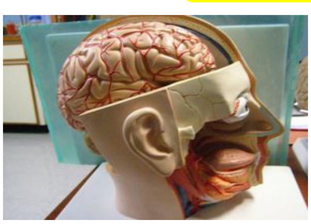
Obesity and addiction: two views

The addiction model has been applied to obesity in a number of ways. Central to each is the idea that someone can become a 'food addict'. What might this mean? Two broad ideas have been discussed. The first is that certain foods (those high in fat, salt and sugar[6–8]) are akin to addictive substances insofar as they engage brain systems and produce behavioural adaptations comparable to those engendered by drugs of abuse. This in itself is not surprising, given that current addiction models suggest that addictive drugs hijack the brain circuitry subserving the motivation for and enjoyment of, among other things, food[9,10]. What the putatively addictive foods are has yet to be fully defined. The case has been made that processed foods — as opposed

Desejo por drogas e alimentos em excesso

Hiperatividade do COF e cingular anterior

Hipoatividade no CPFDL



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Research report

Prefrontal cortex transcranial direct current stimulation (tDCS) temporarily reduces food cravings and increases the self-reported ability to resist food in adults with frequent food craving☆

Rachel L. Goldman[a,*], Jeffrey J. Borckardt[a,b], Heather A. Frohman[b], Patrick M. O'Neil[a], Alok Madan[a], Laura K. Campbell[a], Amanda Budak[a], Mark S. George[a,c,d]

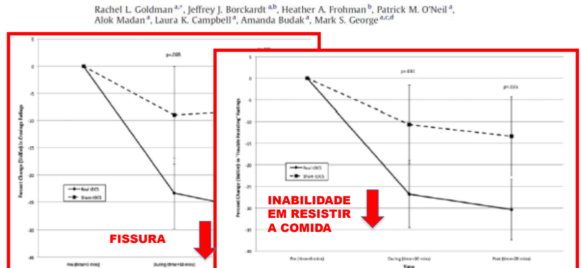

Fig. 1. Mean percent change in cravings ratings in real

Fig. 2. Mean percent change in inability to resist food ratings in real and sham tDCS conditions.

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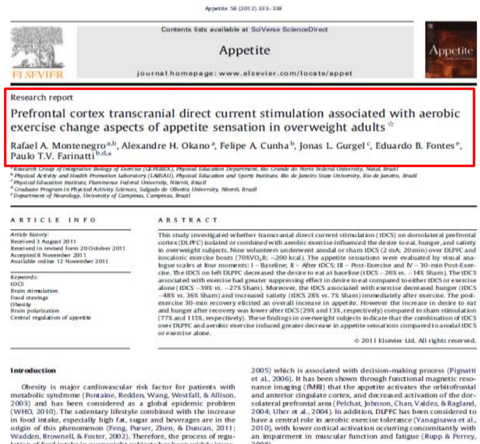

Appetite 58 (2012) 333–338

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Research report

Prefrontal cortex transcranial direct current stimulation associated with aerobic exercise change aspects of appetite sensation in overweight adults ☆

Rafael A. Montenegro [a,b], Alexandre H. Okano [a], Felipe A. Cunha [b], Jonas L. Gurgel [c], Eduardo B. Fontes [e], Paulo T.V. Farinatti [b,d,*]

[a] Research Group of Integrative Biology of Exercise (GEPEBIEX), Physical Education Department, Rio Grande do Norte Federal University, Natal, Brazil
[b] Physical Activity and Health Promotion Laboratory (LABSAU), Physical Education and Sports Institute, Rio de Janeiro State University, Rio de Janeiro, Brazil
[c] Physical Education Institute, Fluminense Federal University, Niterói, Brazil
[d] Graduate Program in Physical Activity Sciences, Salgado de Oliveira University, Niterói, Brazil
[e] Department of Neurology, University of Campinas, Campinas, Brazil

ARTICLE INFO

Article history:
Received 3 August 2011
Received in revised form 20 October 2011
Accepted 8 November 2011
Available online 12 November 2011

Keywords:
tDCS
Brain stimulation
Food cravings
Obesity
Brain polarization
Central regulation of appetite

ABSTRACT

This study investigated whether transcranial direct current stimulation (tDCS) on dorsolateral prefrontal cortex (DLPFC) isolated or combined with aerobic exercise influenced the desire to eat, hunger, and satiety in overweight subjects. Nine volunteers underwent anodal or sham tDCS (2 mA; 20 min) over DLPFC and isocaloric exercise bouts (70%VO_2R; ~200 kcal). The appetite sensations were evaluated by visual analogue scales at four moments: I – Baseline; II – After tDCS; III – Post-Exercise and IV – 30-min Post-Exercise. The tDCS on left DLPFC decreased the desire to eat at baseline (tDCS −26% vs. −14% Sham). The tDCS associated with exercise had greater suppressing effect in desire to eat compared to either tDCS or exercise alone (tDCS −39% vs. −27% Sham). Moreover, the tDCS associated with exercise decreased hunger (tDCS −48% vs. 36% Sham) and increased satiety (tDCS 28% vs. 7% Sham) immediately after exercise. The post-exercise 30-min recovery elicited an overall increase in appetite. However the increase in desire to eat and hunger after recovery was lower after tDCS (29% and 13%, respectively) compared to sham stimulation (77% and 113%, respectively). These findings in overweight subjects indicate that the combination of tDCS over DLPFC and aerobic exercise induced greater decrease in appetite sensations compared to anodal tDCS or exercise alone.

Introduction

Obesity is major cardiovascular risk factor for patients with metabolic syndrome (Fontaine, Redden, Wang, Westfall, & Allison, 2003) and has been considered as a global epidemic problem (WHO, 2010). The sedentary lifestyle combined with the increase in food intake, especially high fat, sugar and beverages are in the origin of this phenomenon (Feng, Purser, Zhen, & Duncan, 2011; Wadden, Brownell, & Foster, 2002). Therefore, the process of regulation of food intake in overweight subjects has been widely inves-

2005) which is associated with decision-making process (Pignatti et al., 2006). It has been shown through functional magnetic resonance imaging (fMRI) that the appetite activates the orbitofrontal and anterior cingulate cortex, and decreased activation of the dorsolateral prefrontal area (Pelchat, Johnson, Chan, Valdez, & Ragland, 2004; Uher et al., 2004). In addition, DLPFC has been considered to have a central role in aerobic exercise tolerance (Yanagisawa et al., 2010), with lower cortical activation occurring concomitantly with an impairment in muscular function and fatigue (Rupp & Perrey, 2008).

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I – PRÉ-ETCC
Repouso de 10min

II – PÓS-ETCC
Repouso de 10min

III – EXERCÍCIO SUBMÁXIMO
Sessão Isocalórica (~200Kcal/ 70%VO2máx)

IV – 30'PÓS-Exercício

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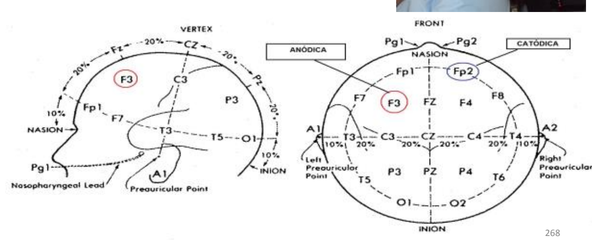

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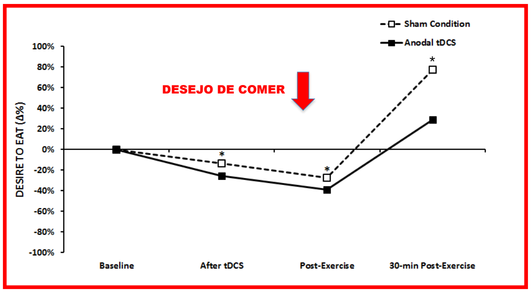

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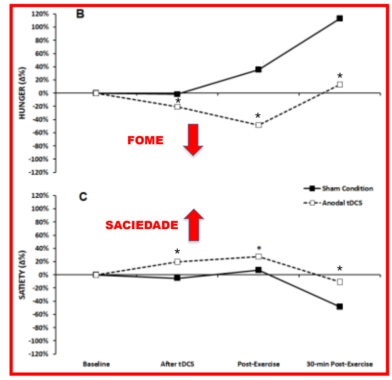

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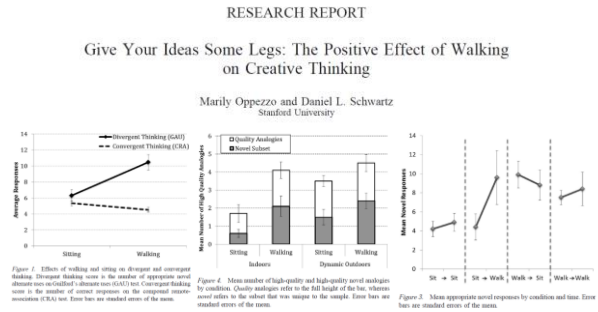
Creatividade

“Produçao de algo novo e útil”

(Runco and Jaeger, 2012, Jung et al., 2013) 272

"All truly great thoughts are conceived by walking"

Friedrich Nietzsche (1889)



RESEARCH REPORT

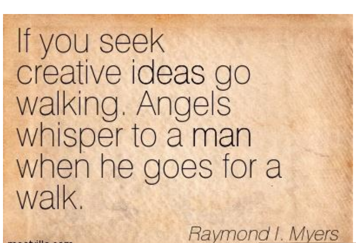
Give Your Ideas Some Legs: The Positive Effect of Walking on Creative Thinking

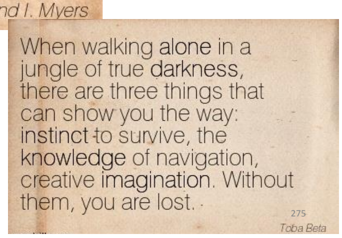
Marily Oppezzo and Daniel L. Schwartz
Stanford University

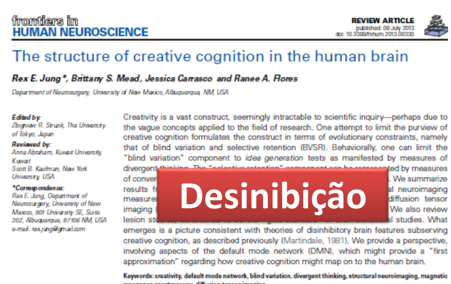
Figure 1. Effects of walking and sitting on divergent and convergent thinking. Divergent thinking score is the number of appropriate novel alternate uses on Guilford's alternate uses (GAU) test. Convergent thinking score is the number of correct responses on the compound remote-association (CRA) test. Error bars are standard errors of the mean.

Figure 4. Mean number of high-quality and high-quality novel analogies by condition. *Quality* analogies refer to the full height of the bar, whereas *novel* refers to the subset that was unique to the sample. Error bars are standard errors of the mean.

Figure 3. Mean appropriate novel responses by condition and time. Error bars are standard errors of the mean.







frontiers in HUMAN NEUROSCIENCE

REVIEW ARTICLE
published: 08 July 2013
doi: 10.3389/fnhum.2013.00330

The structure of creative cognition in the human brain

Rex E. Jung, Brittany S. Mead, Jessica Carrasco and Ranee A. Flores*

Department of Neurosurgery, University of New Mexico, Albuquerque, NM, USA

Edited by:
Zbigniew R. Struzik, The University of Tokyo, Japan

Reviewed by:
Anna Abraham, Kuwait University, Kuwait
Scott B. Kaufman, New York University, USA

***Correspondence:**
Rex E. Jung, Department of Neurosurgery, University of New Mexico, 801 University SE, Suite 202, Albuquerque, 87106 NM, USA
e-mail: rex.jung@gmail.com

Creativity is a vast construct, seemingly intractable to scientific inquiry—perhaps due to the vague concepts applied to the field of research. One attempt to limit the purview of creative cognition formulates the construct in terms of evolutionary constraints, namely that of blind variation and selective retention (BVSR). Behaviorally, one can limit the "blind variation" component to *idea generation* tests as manifested by measures of divergent … ted by measures of conver … . We summarize results f … l neuroimaging measures … diffusion tensor imaging … We also review lesion st … l studies. What emerges is a picture consistent with theories of disinhibitory brain features subserving creative cognition, as described previously (Martindale, 1981). We provide a perspective, involving aspects of the default mode network (DMN), which might provide a "first approximation" regarding how creative cognition might map on to the human brain.

Keywords: creativity, default mode network, blind variation, divergent thinking, structural neuroimaging, magnetic resonance spectroscopy, diffusion tensor imaging

Desinibição

"Every fibre in my body is fatigued and painful,
but my mind is dancing." - John Black

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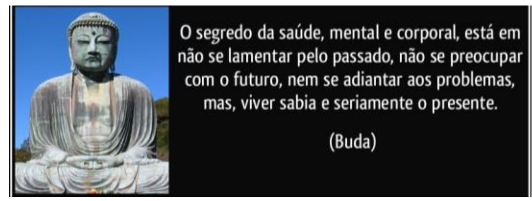

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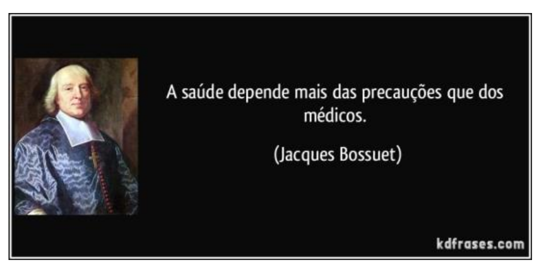

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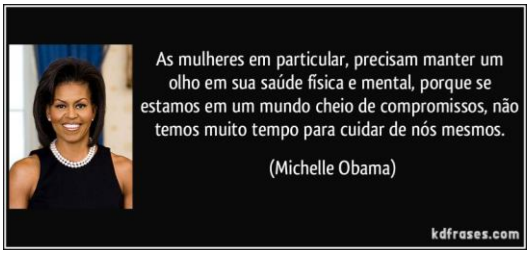

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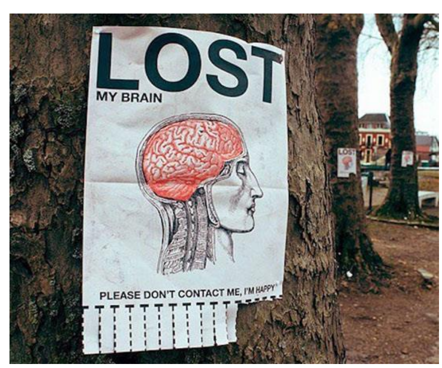

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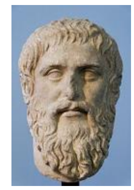

"Para um homem ter sucesso em sua vida, Deus proporcionou à ele dois meios, educação e atividade física. Não separados, como um para a alma e outro para o corpo, mas os dois juntos. Com estes dois meios, homens podem alcançar a perfeição."

Platão, século 4 a.c.

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Obrigado!

eduardobfontes@gmail.com

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