



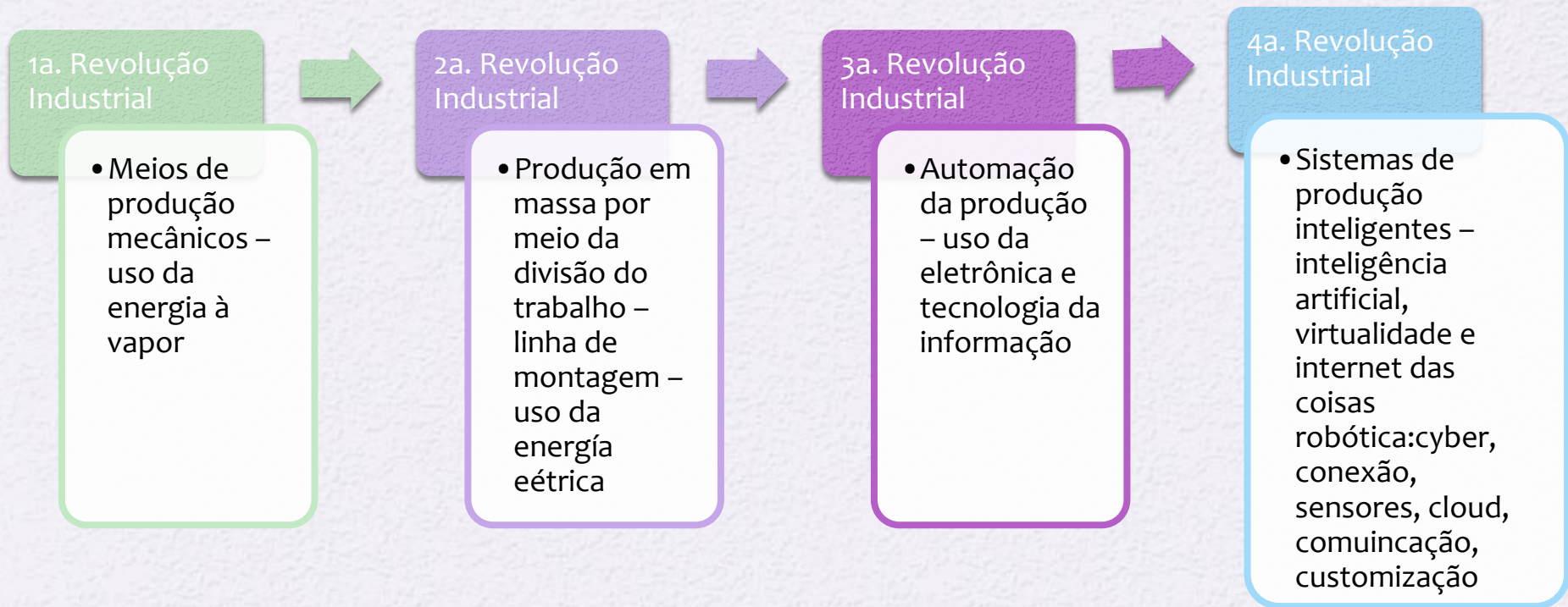
Funções Executivas e Aprendizagem

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Objetivos

- Descrever diferentes habilidades do funcionamento executivo
- Apresentar brevemente os correlatos neurais das Funções Executivas

Revolução Industrial



O Futuro do Trabalho

Fonte: Relatório “Future of Jobs”, World Economic Forum

Solução de problemas complexos

Pensamento crítico

Criatividade

Gestão de pessoal

Empatia

Inteligência Emocional

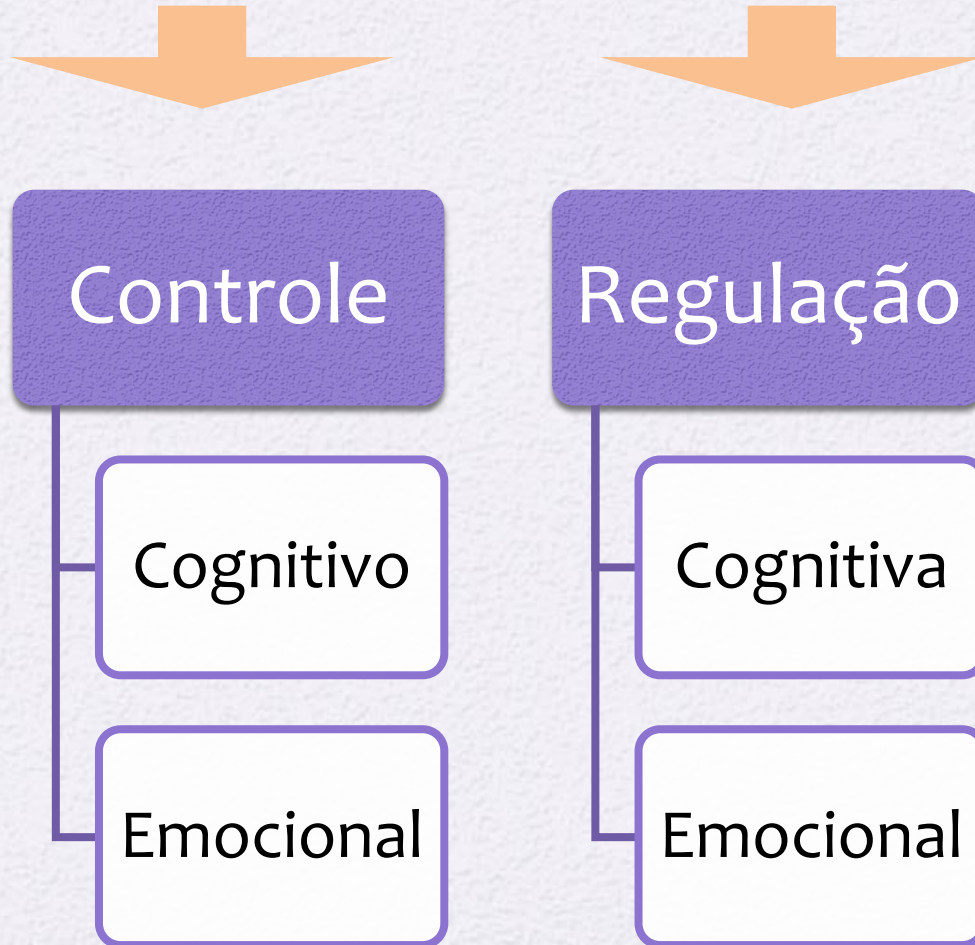
Bom senso e tomada de decisão

Orientação a serviço

Negociação

Flexibilidade cognitiva

Intencionalidade



Funções Executivas

Processos responsáveis
por direcionar e gerenciar
habilidades cognitivas,
emocionais e
comportamentais

Royall et al. (2002)

Funções Executivas

1982 – Muriel Lezak

Habilidades relacionadas à
formulação e organização de
metas

Formulação de metas

Planejamento

Execução voltada à meta

Monitoramento e regulação

THE PROBLEM OF ASSESSING EXECUTIVE FUNCTIONS

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The capacities for formulating goals, planning, and carrying out plans effectively – the executive functions – are essential for independent, creative, and socially constructive behavior. Although they tend to be vulnerable to brain impairment, they are often overlooked in neuropsychological and neurological examinations. Reasons why there are few formalized examination procedures for evaluating executive functions are suggested. Prefrontal contributions and the importance of other brain areas (e.g., subcortical, right hemisphere) to executive functions are discussed. Assessment techniques are presented for evaluating four categories of executive capacities: (1) goal formulation, (2) planning, (3) carrying out goal-directed plans, and (4) effective performance. The Tinkertoy Test*, which can provide information about these capacities, is described in some detail. Need for further exploration in this area is emphasized.

The executive functions comprise those mental capacities necessary for formulating goals, planning how to achieve them, and carrying out the plans effectively. They are at the heart of all socially useful, personally enhancing, constructive, and creative activities. With the executive functions intact, a person can suffer many different kinds and combinations of sensory, motor, and cognitive deficits and still maintain the direction of his own life and be productive as well. Impairment or loss of these functions compromises a person's capacity to maintain an independent, constructively self-serving, and socially productive life no matter how well he can see and hear, walk and talk, and perform tests.

Yet crucial as the executive functions are for normal behavior, there are not many assessment methods generally available for examining them. With few exceptions we do not have standardized methods for making objective or reliably replicable estimates of gradations of impairment of these functions, for example, or for making intra- and interindividual comparisons. Without assessment techniques that can

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Modelos teóricos: conceitos e componentes das Funções Executivas

Table 1 Concepts and components of executive function

Author	Concepts and/or components of executive functions
Lezak (1983)	Volition, planning, purposive action, effective performance
Baddeley and Hitch (1974)	Central executive, phonological loop, visuospatial sketchpad
Norman and Shallice (1986)	Supervisory attentional system
Lafleche and Albert (1995)	Concurrent manipulation of information: cognitive flexibility, concept formation, cue-directed behavior
Borkowsky and Burke (1996)	Task analysis, strategy control, strategy monitoring
Anderson et al. (2001b)	Attentional control, cognitive flexibility, goal setting
Delis et al. (2001)	Flexibility of thinking, inhibition, problem-solving, planning, impulse control, concept formation, abstract thinking, creativity
Hobson and Leeds (2001)	Planning, initiation, preservation and alteration of goal-directed behavior
Piguet et al. (2002)	Concept formation, reasoning, cognitive flexibility
Elliot (2003)	Solving novel problems, modifying behavior in light of new information, generating strategies, sequencing complex actions
Banich (2004)	Purposeful and coordinated organization of behavior. Reflection and analysis of the success of the strategies employed

modelos teóricos

Habilidades fundamentais para comportamentos orientados para metas

Funções Executivas não constituem um construto unitário, mas multidimensional, com habilidades componentes

Funções Executivas

2013 – Adele Diamond

Perspectiva multidimensional:
habilidades básicas
habilidades de alta ordem

Integração entre as habilidades
Evidências empíricas
Desenvolvimento

Executive Functions

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Keywords

cognitive control, self-regulation, creativity, attention, reasoning,
working memory, fluid intelligence, inhibitory control, task switching,
mental flexibility

Abstract

Executive functions (EFs) make possible mentally playing with ideas, taking the time to think before acting, meeting novel, unanticipated challenges, resisting temptations, and staying focused. Core EFs are inhibition (response inhibition [self-control—resisting temptations and reasoning acting impulsively] and interference control [selective attention and cognitive inhibition]), working memory, and cognitive flexibility (including creatively thinking “outside the box,” seeing anything from different perspectives, and quickly and flexibly adapting to changed circumstances). The developmental progression and representative measures of each are discussed. Controversies are addressed (e.g., the relation between EFs and fluid intelligence, self-regulation, executive attention, and effortful control, and the relation between working memory and inhibition and attention). The importance of social, emotional, and physical health for cognitive health is discussed because stress, lack of sleep, loneliness, or lack of exercise each impair EFs. That EFs are trainable and can be improved with practice is addressed, including diverse methods used thus far.

Funções Executivas

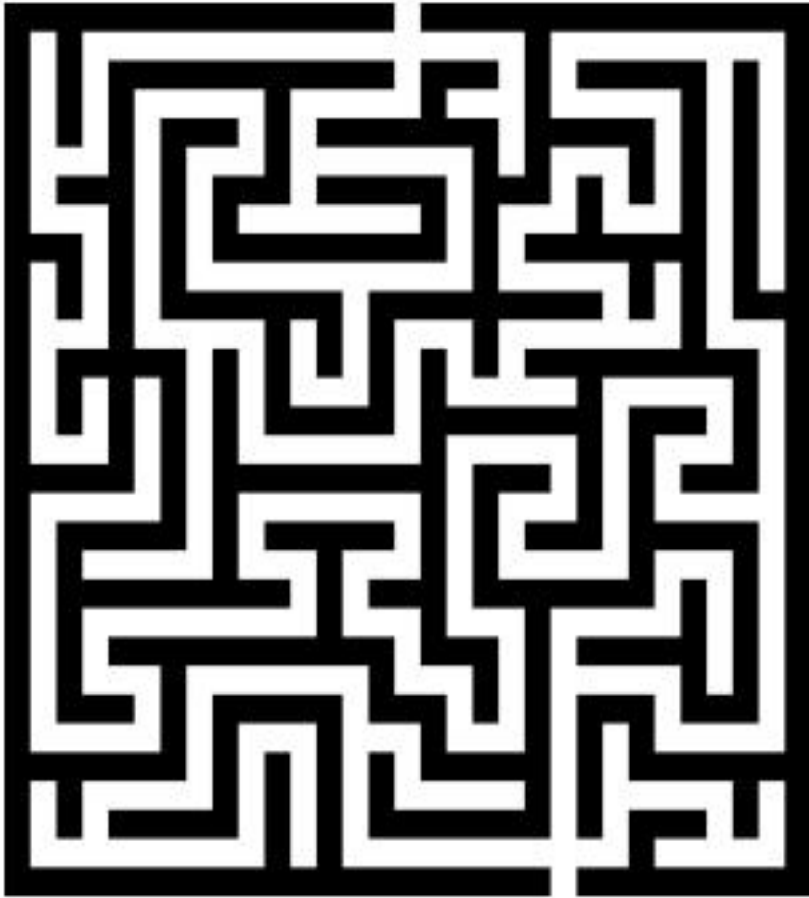
Diamond (2013)

Habilidades Básicas Fundamentais

Controle Inibitório
Memória de trabalho
Flexibilidade Cognitiva

Planejamento
Raciocínio
Solução de Problemas

Controle Inibitório



Ter a habilidade de:

- controlar ação impulsiva, não se precipitar
- Pensar antes de agir ou falar
- Controlar raiva ou reações agressivas

Controle Inibitório

- Habilidade de resistir à ação impulsiva ou interromper as ações em tempo apropriado
 - Habilidade de pensar antes de agir
 - Habilidade de resistir ao desejo de dizer ou de fazer algo, a tempo de poder avaliar a situação ou o impacto da ação
- Habilidade de adiar gratificação
- Habilidade de lidar com distrações ou interrupções que possam interferir com outras funções executivas
 - “Preciso me afastar dos meus amigos na sala de aula e sentar perto de minha professora para poder prestar mais atenção ao que ela diz”

Flexibilidade

Mudar o curso dos planos em função de oportunidades ou obstáculos

Adaptar-se às mudanças

Poder reconhecer o erro e mudar o curso da ação em função da nova informação



Flexibilidade Cognitiva

- Habilidade de poder passar de uma situação, atividade a outra, segundo as demandas da situação
- A flexibilidade cognitiva inclui as habilidades de:
 - tolerar mudanças
 - mudar
 - alternar a atenção
 - mudar o foco de uma ideia ou tópico,
 - pensar ou reconhecer diferentes formas de resolver problemas

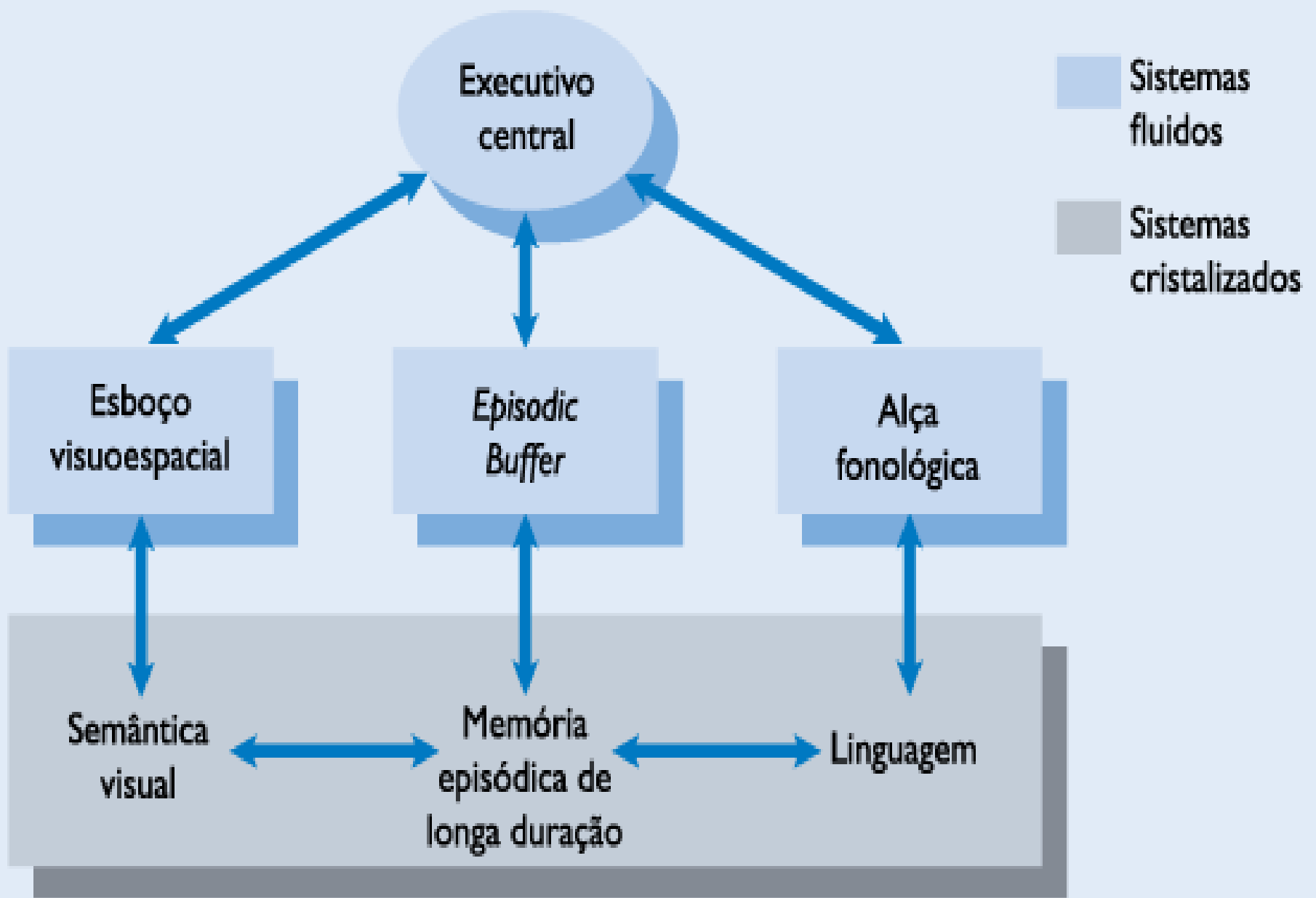
Memória de Trabalho

Controle cognitivo da informação

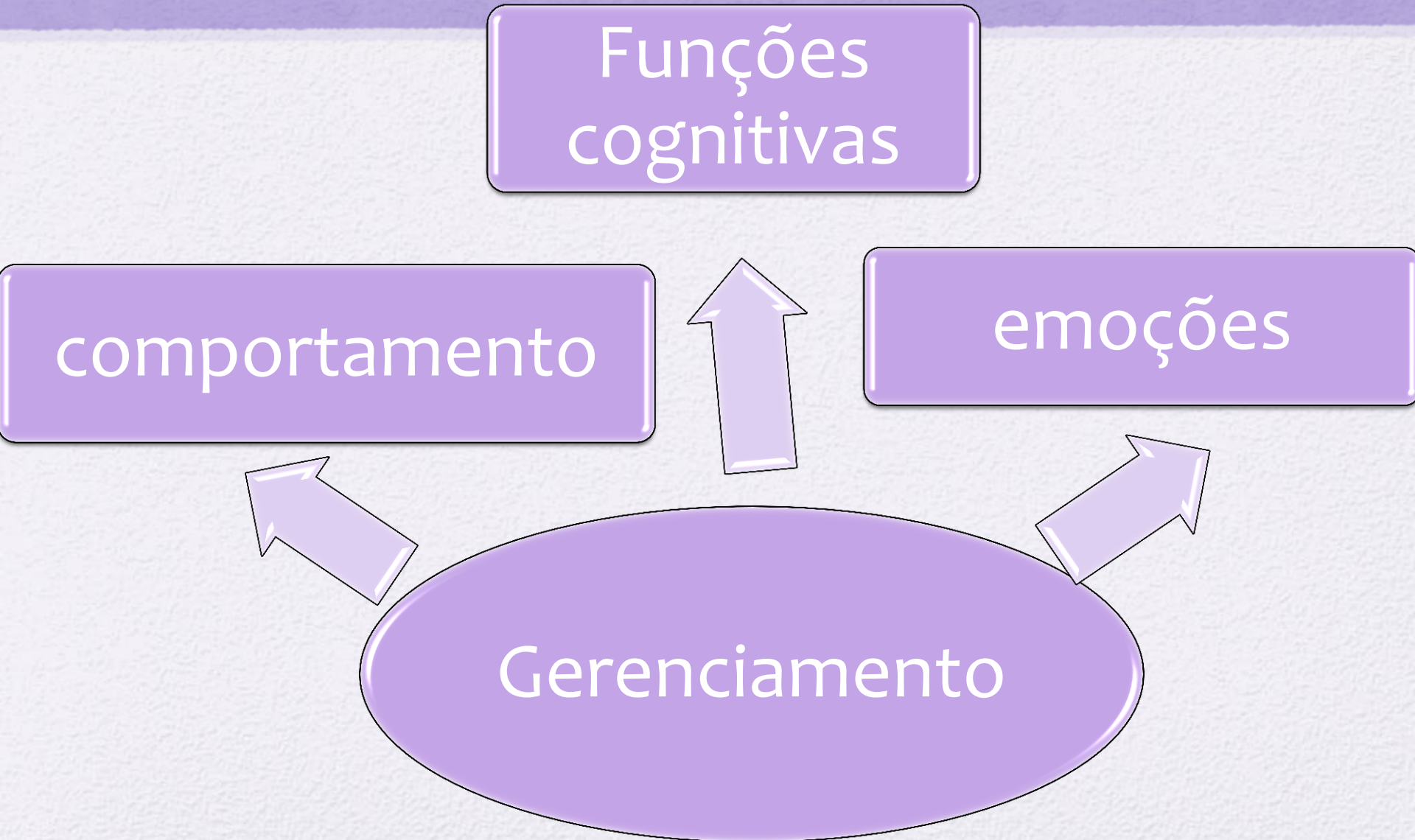
Manter a informação por tempo limitado

Manipulação mental da informação

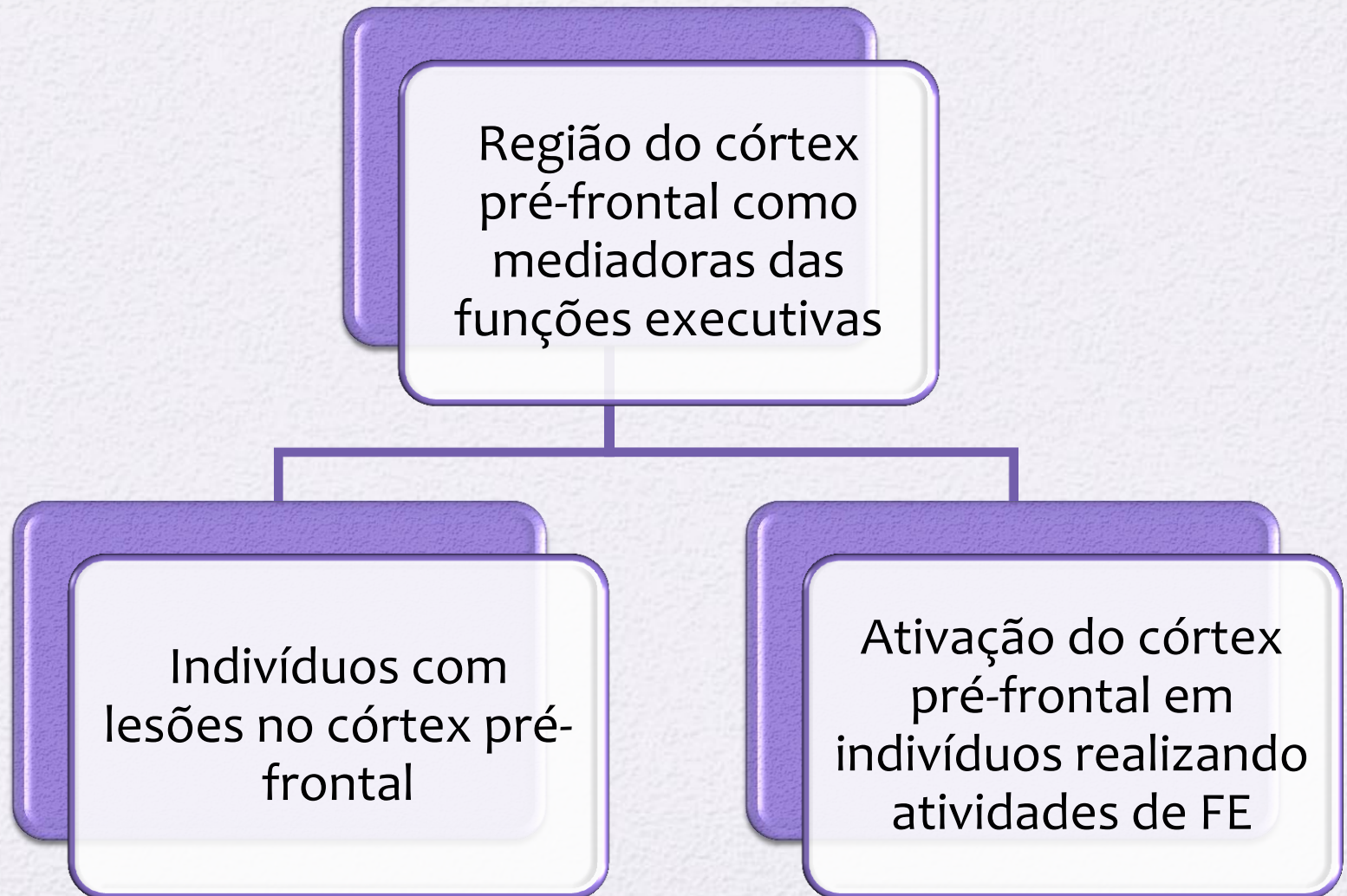
Possibilita a integração da informação



Funções Executivas



correlatos neurais das funções executivas





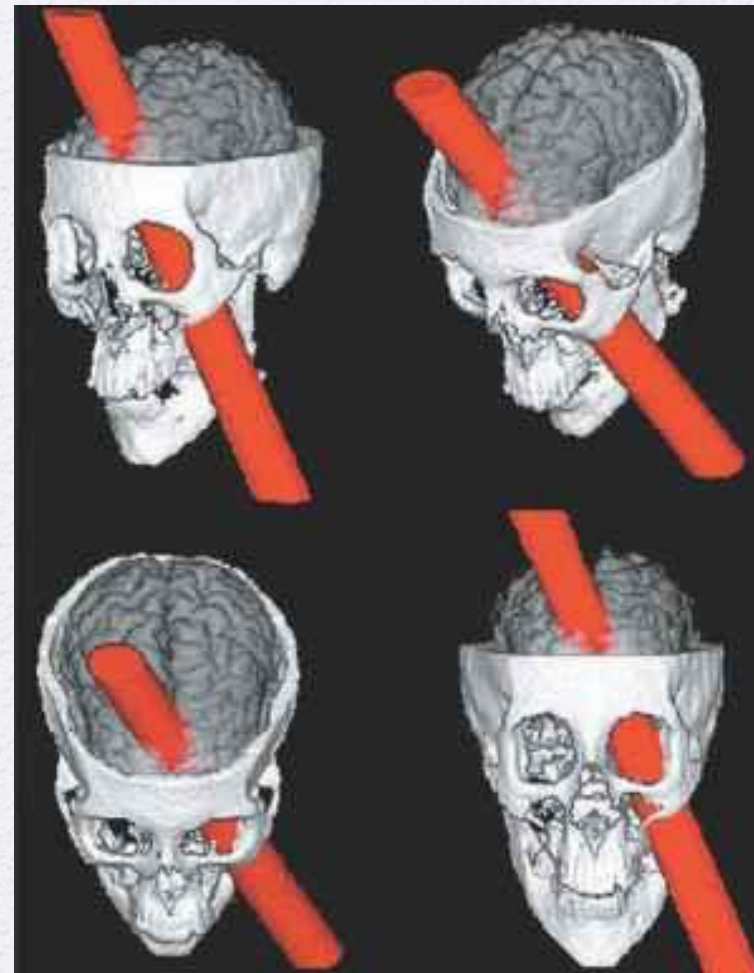
Agressividade

Mau gênio

Grosseria

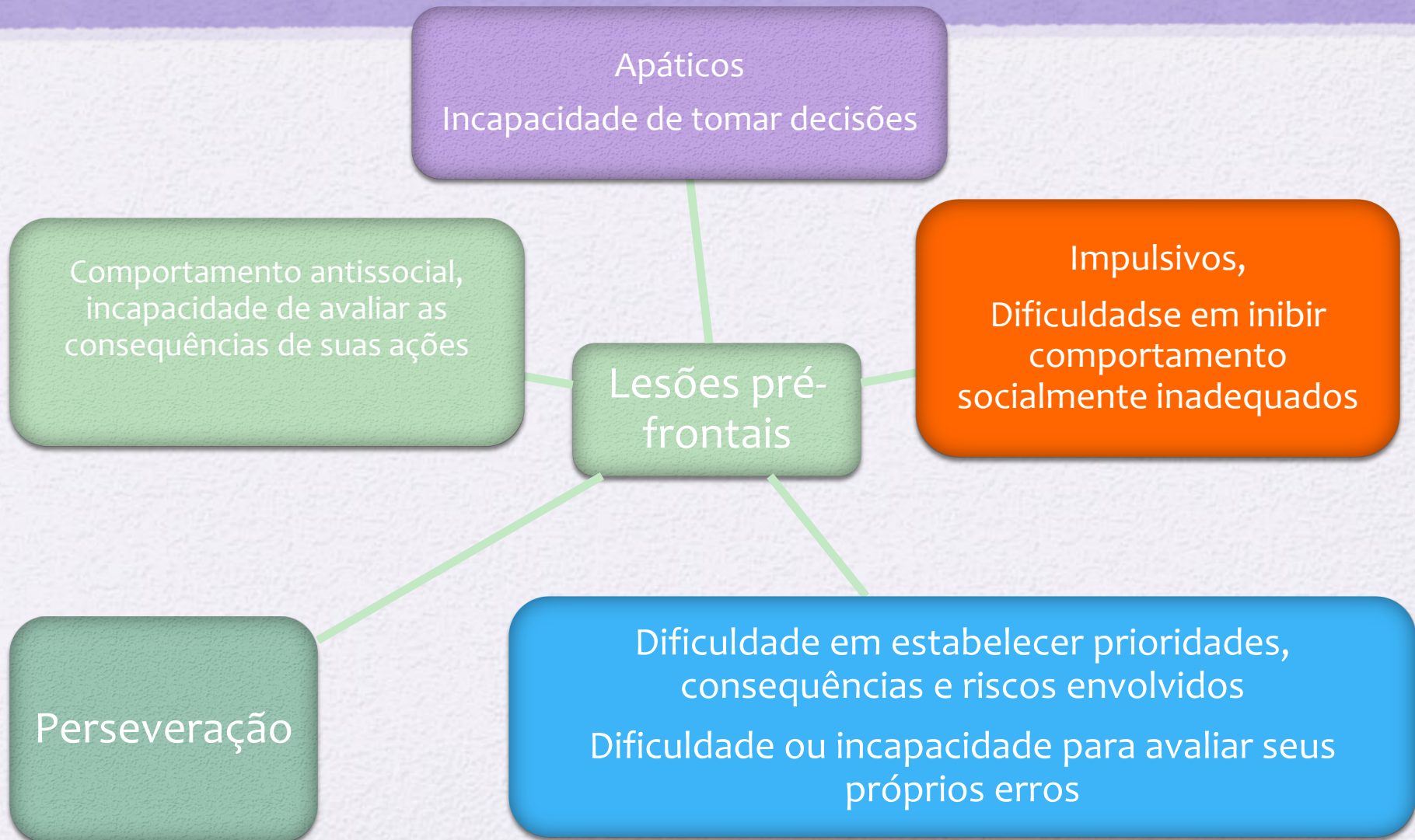
Incapacidade de aceitar conselhos

Impulsividade

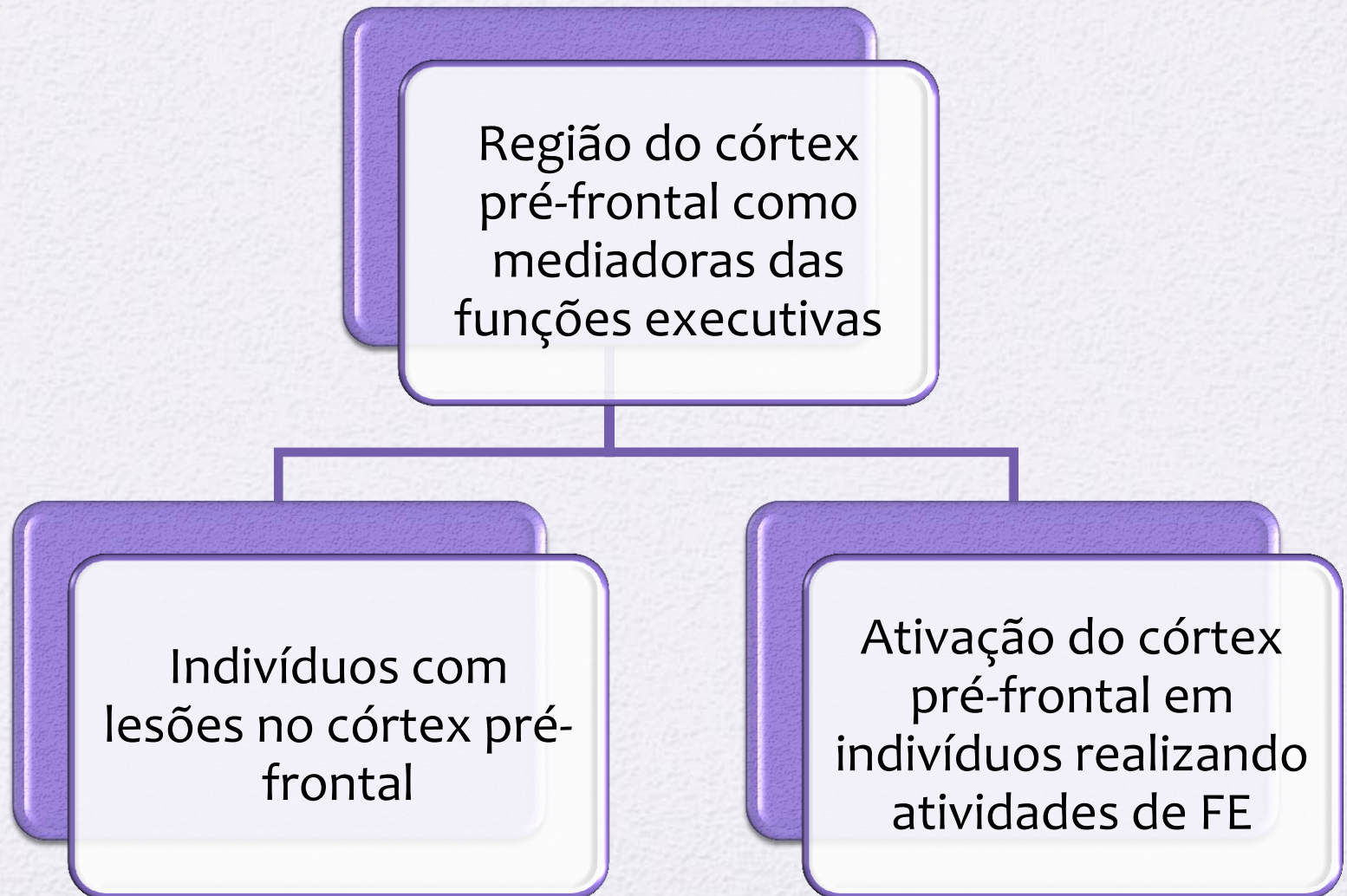


Phineas Gage - 1848

Indivíduos com lesões pré-frontais



correlatos neurais das funções executivas



correlatos neurais: realização de tarefas de FE

- Regiões anteriores do cérebro medeiam o funcionamento executivo
- Ativação do córtex pré-frontal em indivíduos realizando EF testes



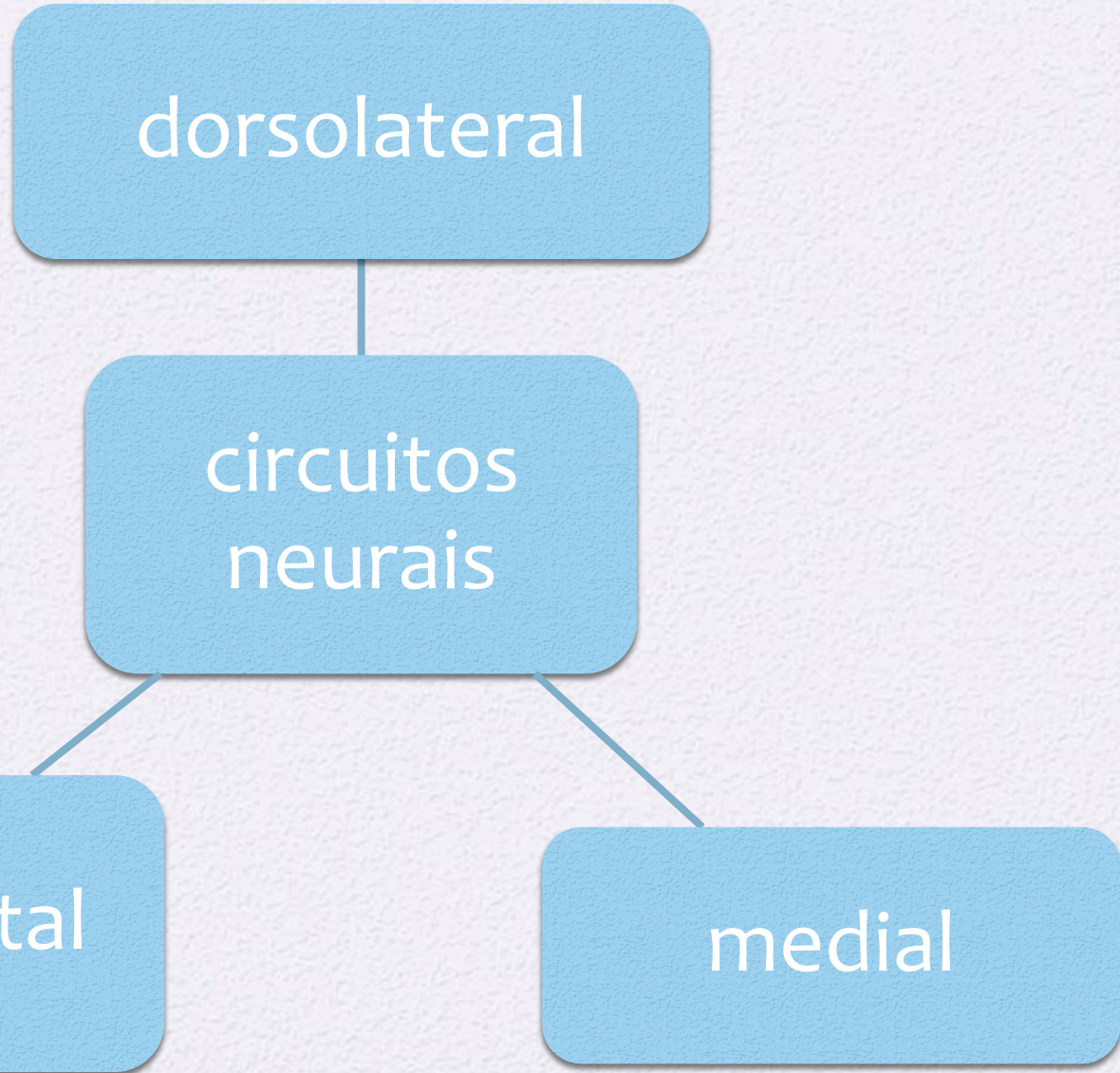
- integridade do cortex pré-frontal é condição necessária para a realização das tarefa de FE

dorsolateral

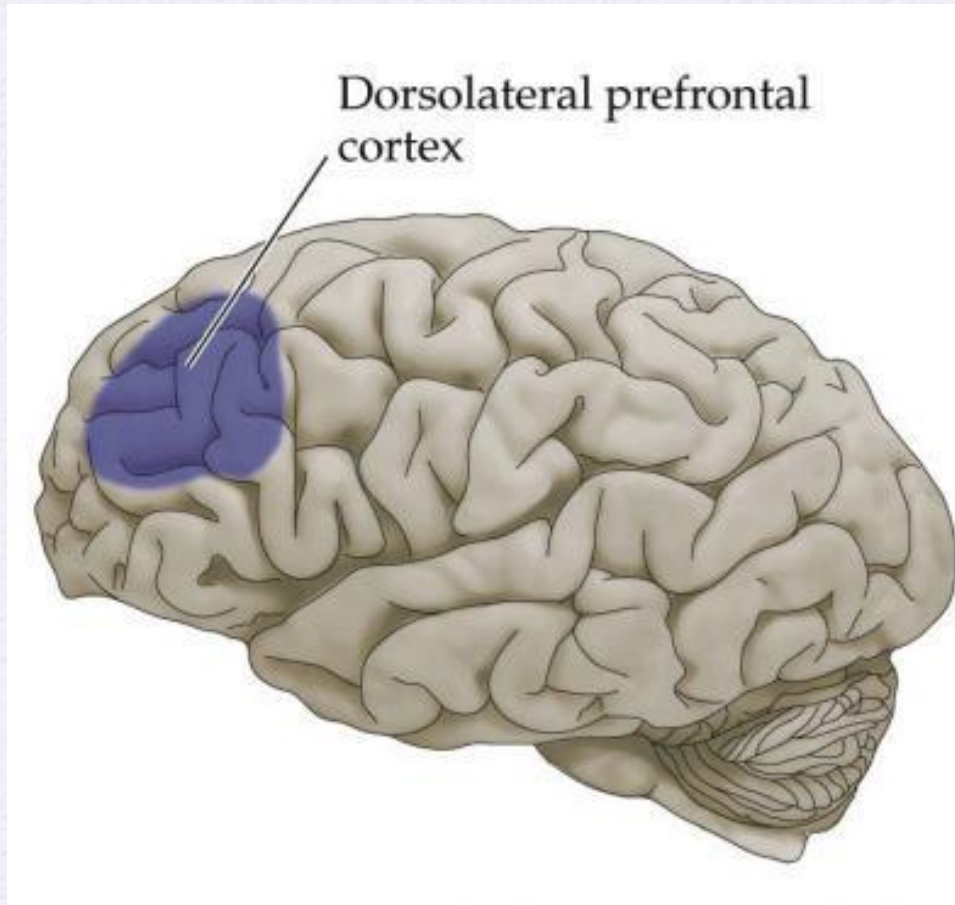
circuitos
neuraís

orbitofrontal

medial

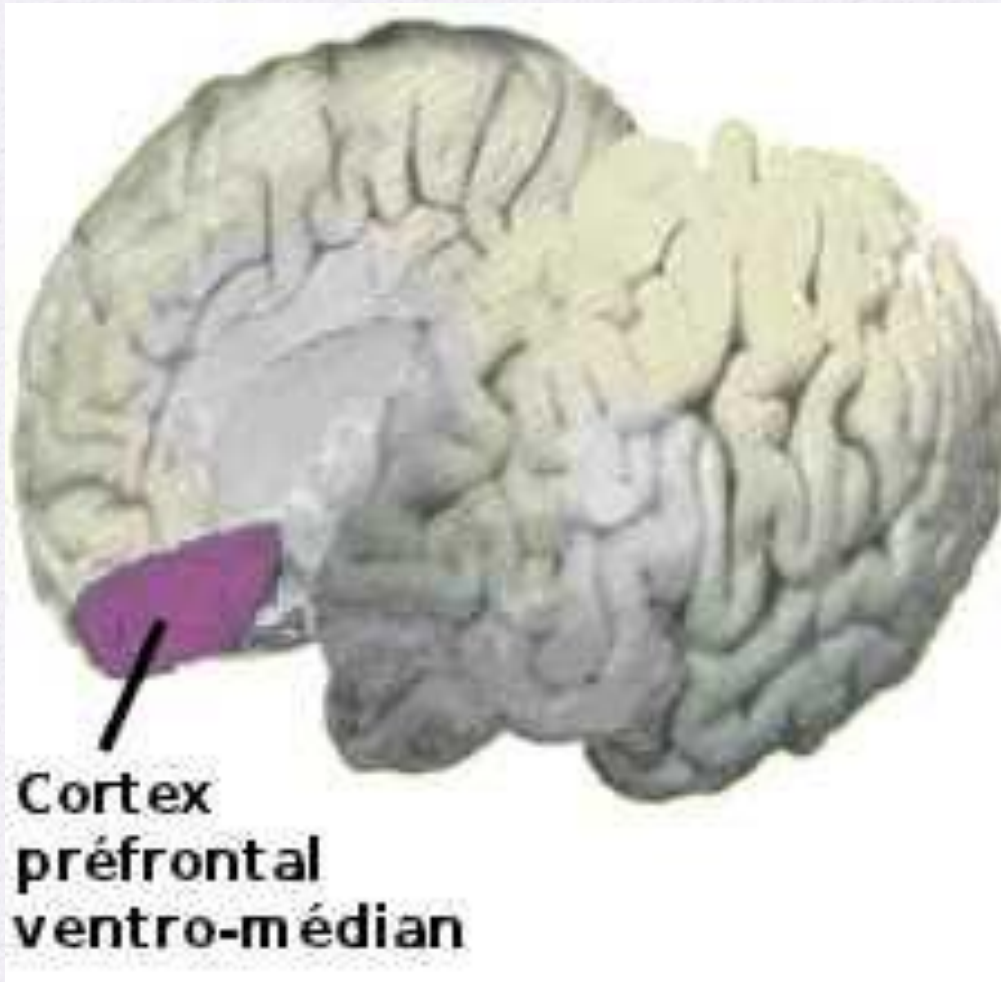


circuito dorsolateral



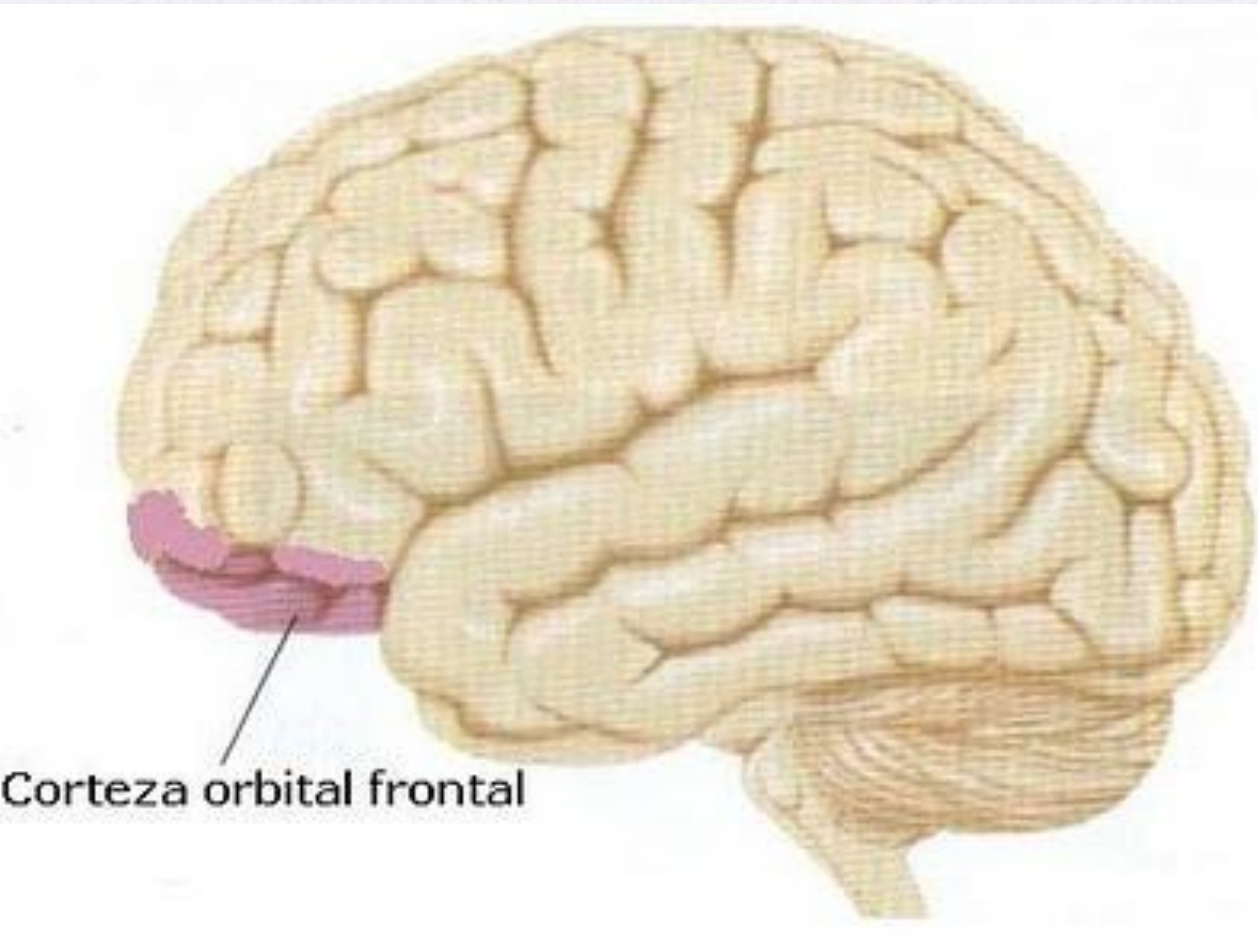
- Situado na parte externa do cérebro
- Planejamento e flexibilidade
- Circuito envolvido com a memória de trabalho

circuito medial



- Inclui a superfície medial do cérebro e a porção mais anterior do giro do cíngulo
- Automonitoramento e correção de erros
- Circuito envolvido com a atenção

circuito orbitofrontal



- Situa-se na porção inferior do córtex pré-frontal
- Avaliação de riscos e inibição de respostas inapropriadas

