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Sono e comportamento Causa ou consequência?

Filipe Glória Silva



16 CONGRESSO
NACIONAL DE
PEDIATRIA

22-24 OUTUBRO 2015 | ALBUFEIRA





Hiperatividade e Déficit de Atenção



As respostas que pais
e professores procuram

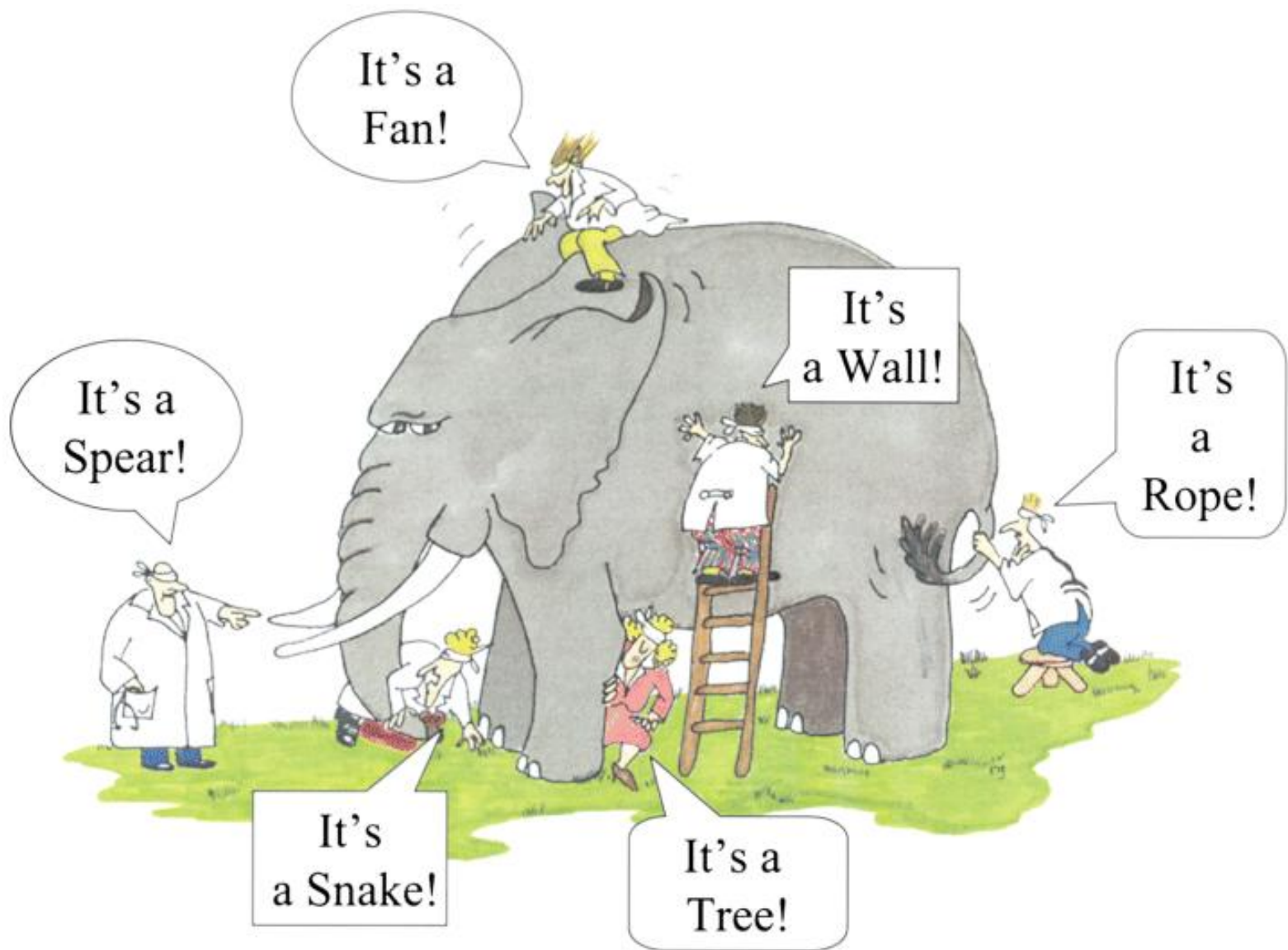
O LIVRO DE
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Sono regular pode ser o segredo para bom comportamento

PESQUISA BRITÂNICA REVELA QUE CRIANÇAS COM HORAS DE SONO IRREGULARES SÃO MAIS HIPERATIVAS E TENDEM A TER MAL COMPORTAMENTO



REDAÇÃO PAIS&FILHOS

16.10.2013

Changes in Bedtime Schedules and Behavioral Difficulties in 7 Year Old Children

Pediatrics
2013
Kelly et al.

METHODS: Data from 10 230 7-year-olds from the UK Millennium Cohort Study, with bedtime data collected at 3, 5, and 7 years, and behavioral difficulties scores as rated by mothers and teachers were analyzed.

Comportamentos avaliados com SDQ (pais e prof.)

- (1) Sintomas emocionais
- (2) Problemas de comportamento
- (3) Hiperatividade
- (4) Problemas de relacionamento com os colegas
- (5) Comportamento pró-social

Pontuação Total de Dificuldades

Fatores associados com hora de deitar irregular

- Problemas de comportamento

- Desvantagem social (rendimentos, escolaridade)
- Pior saúde mental da mãe
- Alterações noutras rotinas: não tomar o pequeno almoço, sem leitura de histórias
- Mais de 3h/dia de TV
- Ter TV no quarto

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Modelos de regressão linear para predição dos problemas de comportamento

Fatores confundentes controlados:

- Rendimentos da família
- Nível educacional
- Estado emprego/desemprego
- Idade da mãe
- Stress materno (*Kessler-6 Q*)
- Estratégias educativas (*Conflict Tactics Scale*)
- Ajuda da mãe na matemática
- Horas de TV, regras TV, TV no quarto
- Se pais sentem que têm tempo suficiente com a criança
- Sono perturbado por sibilância

Associações do sono com os problemas de comportamento:

Tempo de sono: não significativo

Hora de deitar irregular: efeito menor
MAS significativo

Efeito cumulativo: pior se hora de deitar irregular nas 3 idades estudadas

Melhoria da regularidade aos 5 e 7 anos:
Prediz melhor comportamento
“Reversibilidade”

Changes in Bedtime Schedules and Behavioral Difficulties in 7 Year Old Children

Pediatrics
2013
Kelly et al.

[Comentário Anne Martin](#), Senior Research Scientist

Lauren Hale and Jeanne Brooks-Gunn, Columbia University

We have conducted similar tests of the reversibility of aggressive behaviors associated with sleep problems in the US;

However, our models also address directionality, whereas Kelly and colleagues modeled only the pathway from sleep to behavior. As Kelly et al. noted, the direction of the causal link between sleep problems and aggression is unclear.

While it is plausible that a lack of sleep leads to elevated aggression, it is also plausible that aggressive behavior disturbs sleep.

Children who are aggressive may be unusually resistant to bedtime, find it difficult to fall asleep, or be frequently wakened by nightmares.

...

Not only did changes in sleep problems predict changes in aggression, but the reverse was also true.

Short Nighttime Sleep-Duration and Hyperactivity Trajectories in Early Childhood

Pediatrics
2013
Touchette et al.

Estudo observacional

- Aplicados questionários aos pais de 2057 crianças de 1,5 – 5A
- Crianças com sono curto

→ OR 4.2 para hiperatividade

Associado tb a sexo masculino, baixo nível socioeconómico, baixa escolaridade da mãe, e ser confortado de noite fora da cama aos 18m...

- Crianças com índice de hiperatividade ++
→ OR 5.1 para sono curto

Original Article

Sleep and behavioral/emotional problems in children: A population-based study

S. Carvalho Bos ^{a,*}, A. Gomes ^b, V. Clemente ^c, M. Marques ^a, A.T. Pereira ^a, B. Maia ^a,
M.J. Soares ^a, A.S. Cabral ^a, A. Macedo ^a, D. Gozal ^d, M.H. Azevedo ^a

- **Observational study**

- Rutter Scale B2 was completed by teachers
- Representative population sample: 779 children 6–11 years
- Conclusion: Bedtime resistance was the only sleep behavior associated with either hyperactivity or conduct problems in children,
and **longer sleep durations appear to occur more frequently in children with both hyperactive or emotional problems**

Poor sleep and psychiatric symptoms at school: an epidemiological study.

Paavonen EJ¹, Almqvist F, Tamminen T, Moilanen I, Piha J, Räsänen E, Aronen ET.

- **Observational study**
- **Random sample N=5813**, eight- to nine-year-old
- Psychiatric symptoms addressed according to the teachers' reports (the Rutter Scale B)
- **Children with severe sleep problems were more likely to have a psychiatric disturbance (OR 2.45, 95% CI 1.85-3.25)**
- Logistic regression models showed that **severe sleep problems were highly associated with:**
 - **emotional problems (OR 2.74, 95% CI 1.84-4.13)**
 - **school attendance problems (OR 2.53, 95% OR 1.45-4.41)**
 - **behavioural problems (OR 2.44, 95% CI 1.59-3.75)**
 - **hyperactivity (OR 2.02, 95% CI 1.30-3.13).**

Caso particular: Apneia do sono

- Sono fragmentado
- Importância da hipóxia

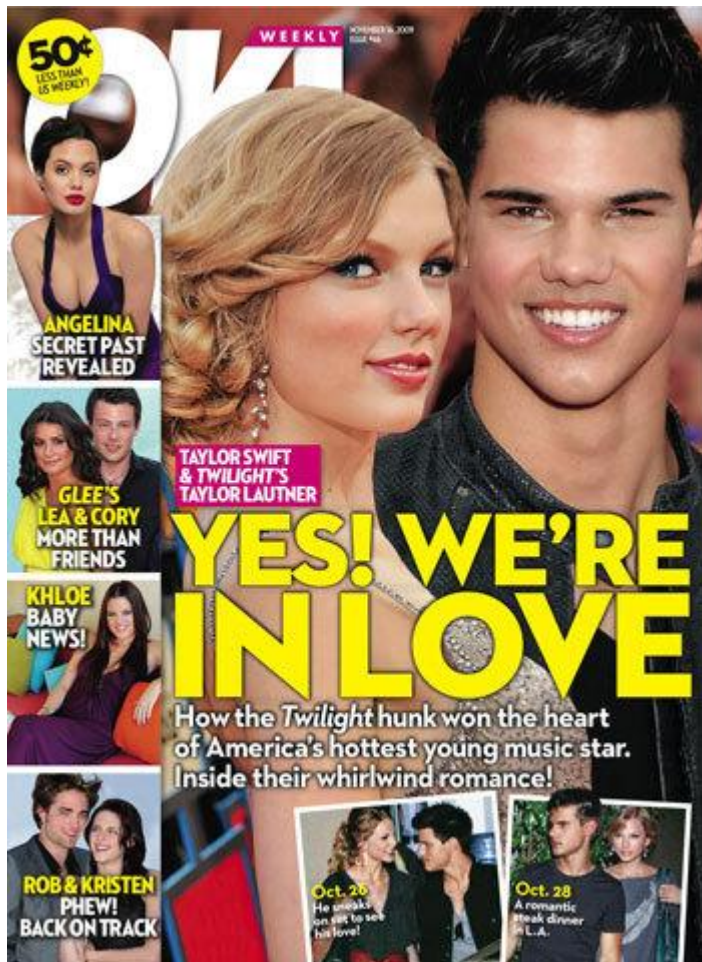
Associada a:

- Perturbação de funções executivas
- **Alterações comportamentais**
- **Alterações do humor**
- Diminuição da performance escolar
- Défices cognitivos?
- Consequências cardiovasculares



medimoon.com

Beebe, 2006



Comportamento

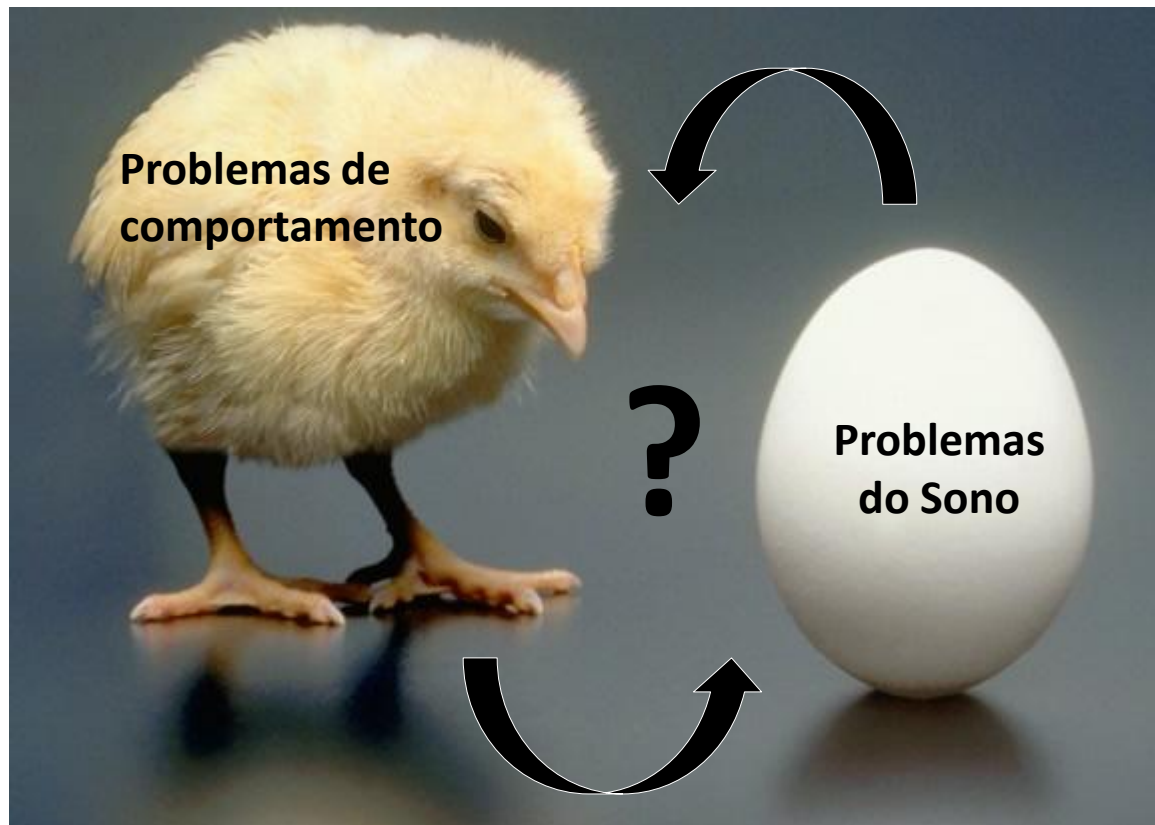


Sono



Direcionalidade

O que surge primeiro?

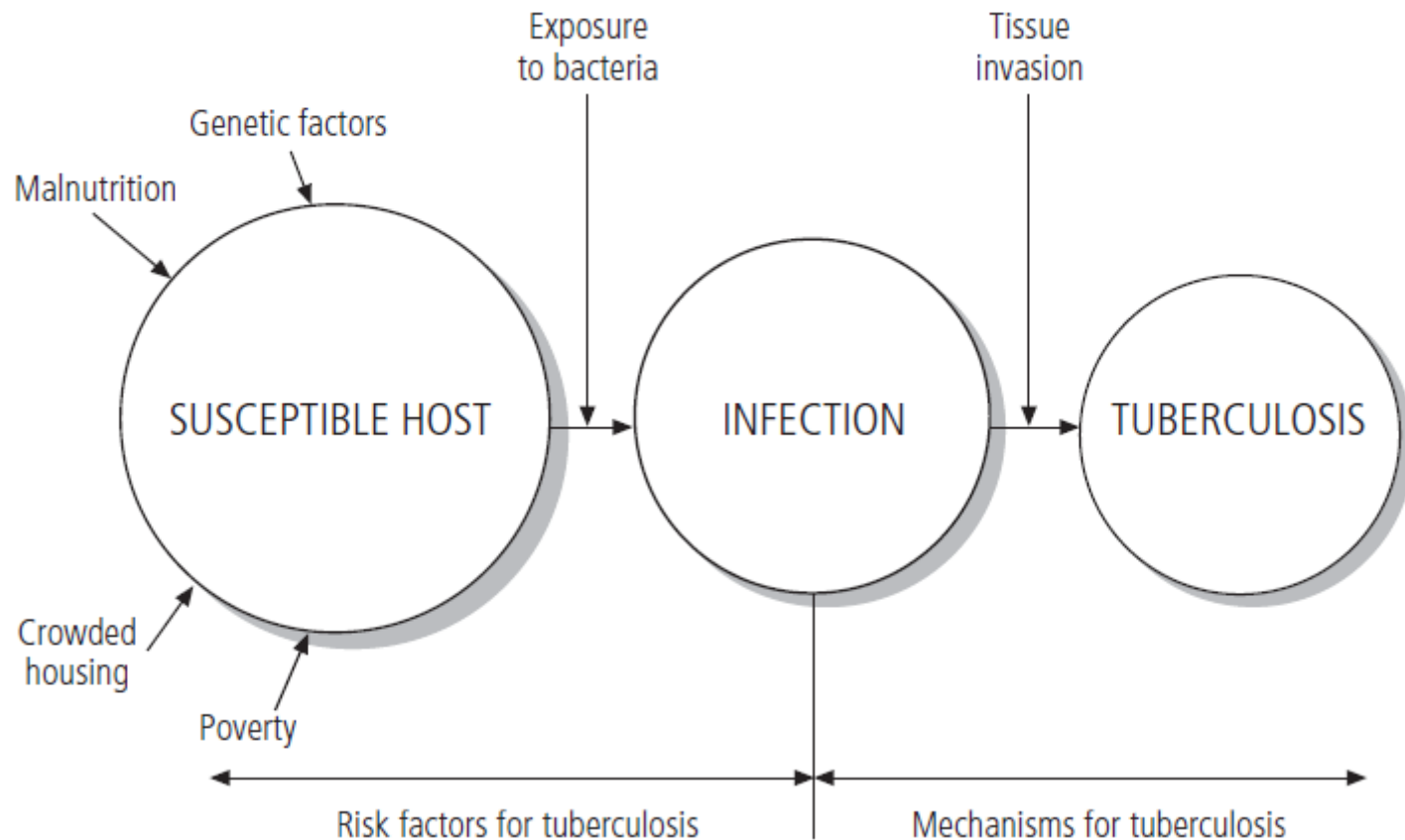


Inferência causal em epidemiologia

- A partir das *causas* ou dos *efeitos*
- Causas *suficientes* ou *necessárias*
- **Etiologias multifatoriais**
 - Adição de fatores
 - Fração atribuível
 - Hierarquia de causas
 - *Causal pathway*

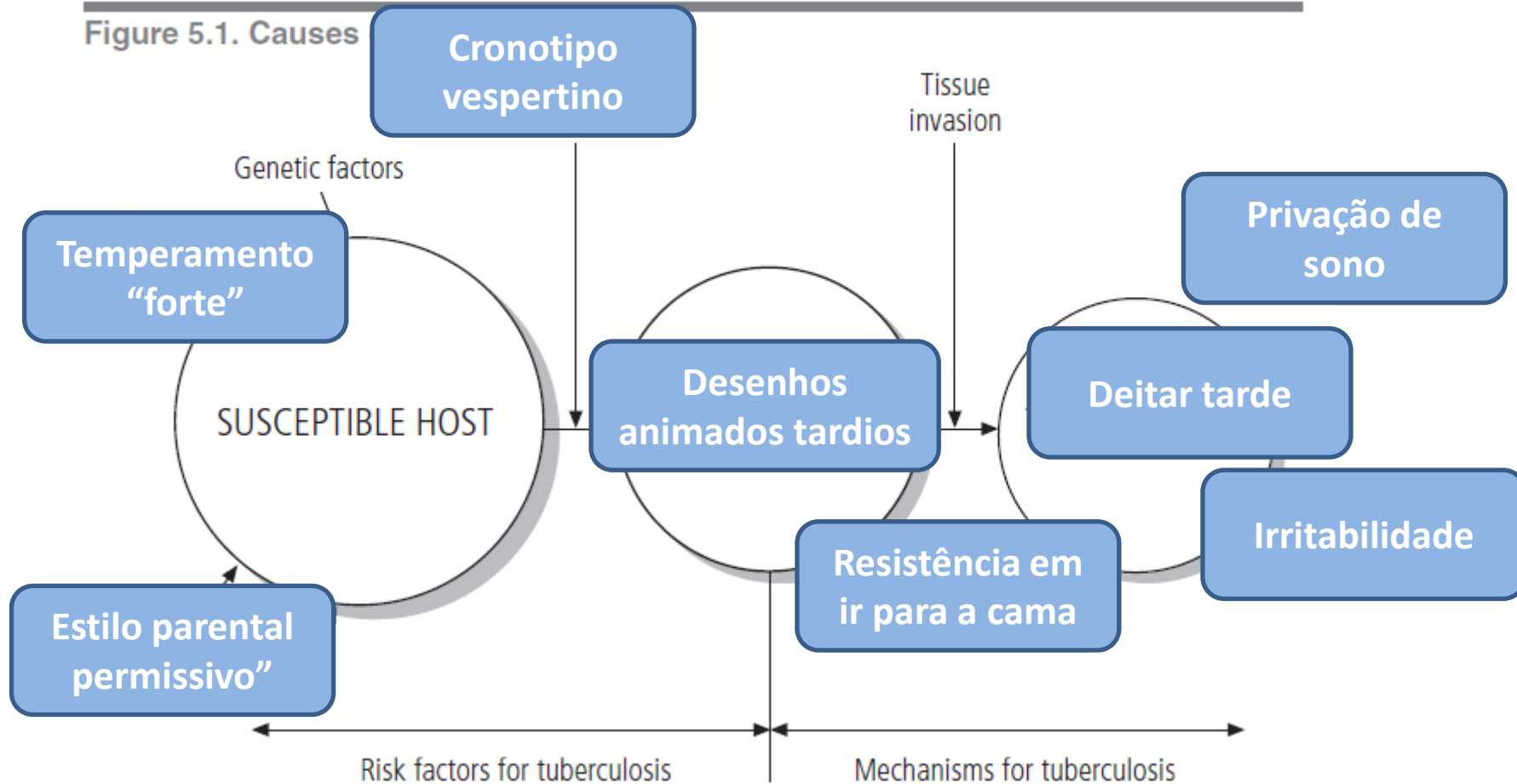
Diferentes tipo de causas

Figure 5.1. Causes of tuberculosis



Diferentes tipo de causas

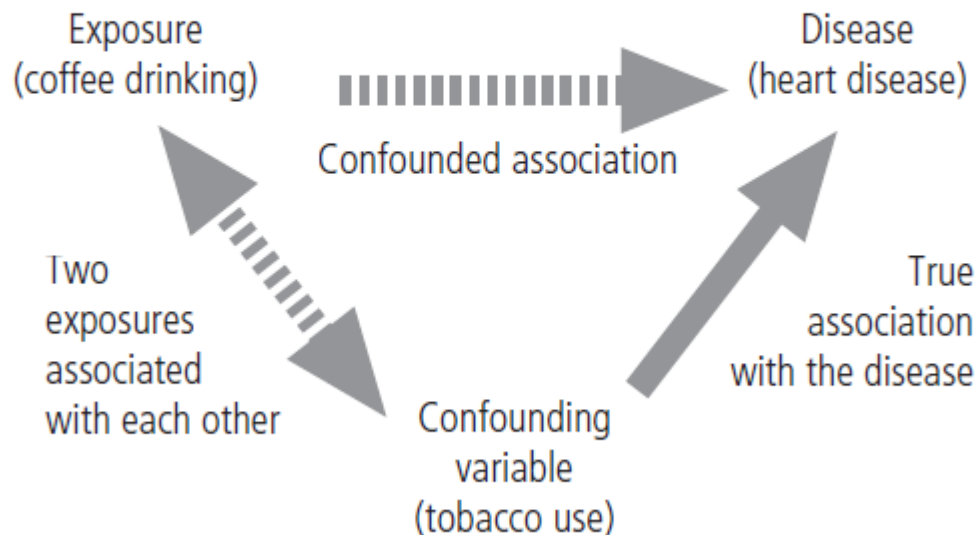
Figure 5.1. Causes



Inferência causal

- Excluir erro de medição, associação aleatória, fatores confundentes...

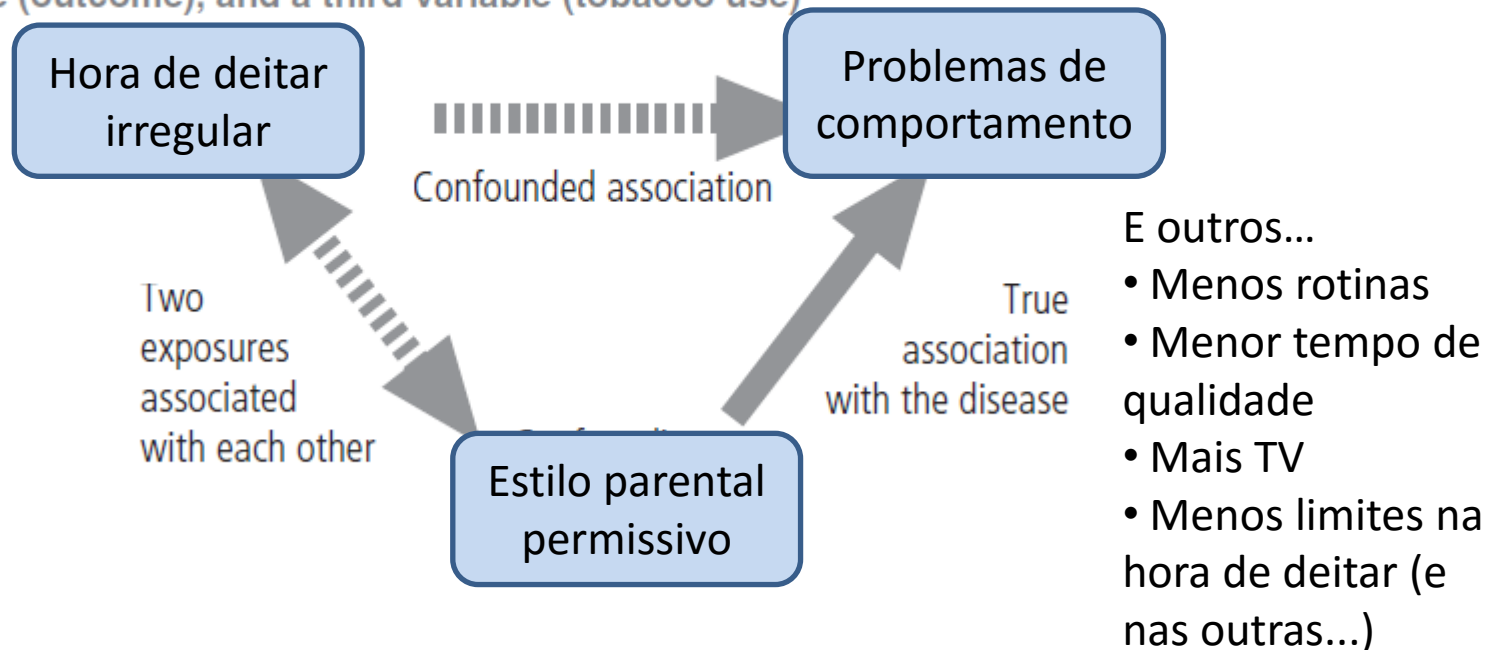
Figure 3.10. Confounding: relationship between coffee drinking (exposure), heart disease (outcome), and a third variable (tobacco use)



Inferência causal

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Figure 3.10. Confounding: relationship between coffee drinking (exposure), heart disease (outcome), and a third variable (tobacco use)



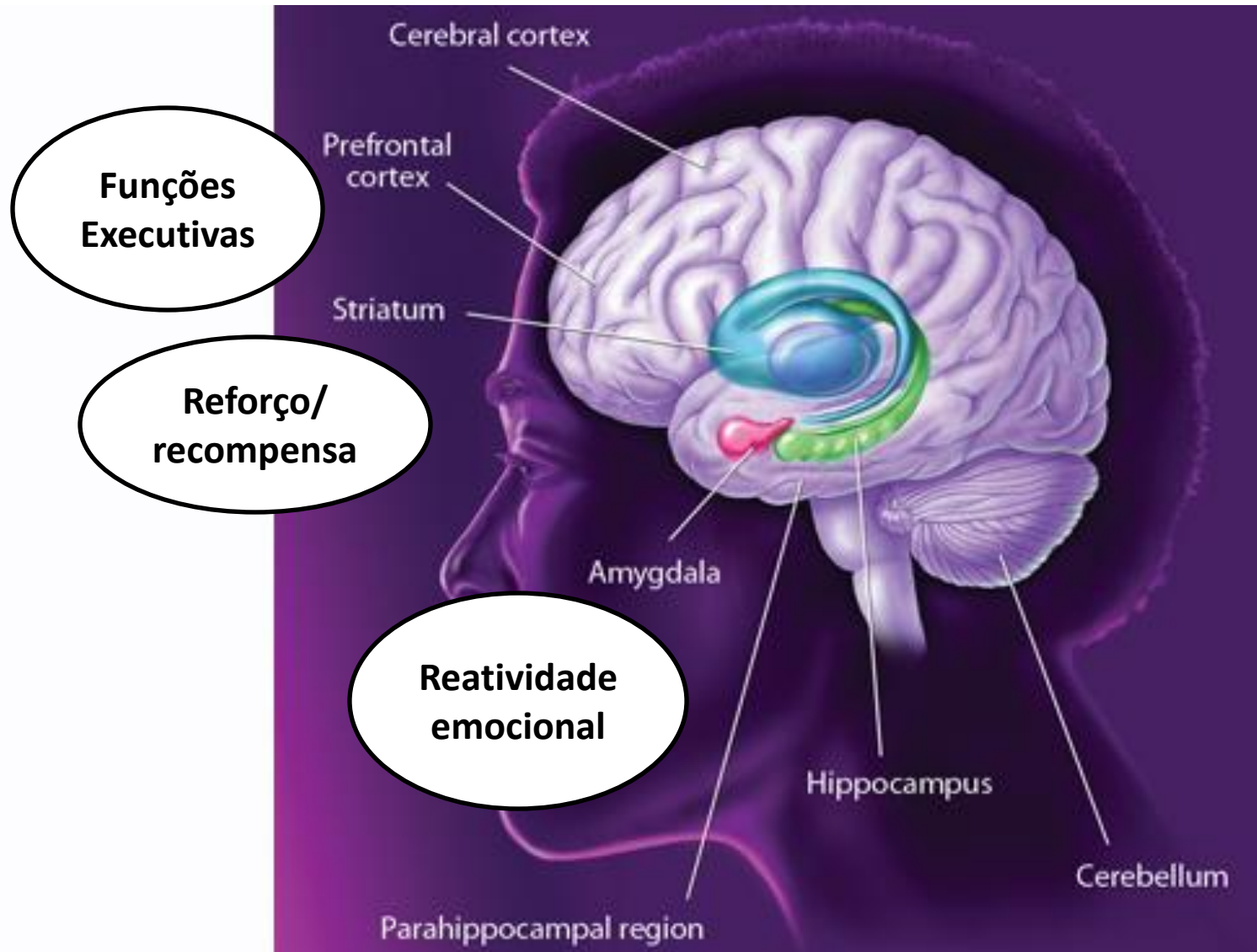
Inferência causal

Sono - Comportamento

Table 5.1. Considerations for causation

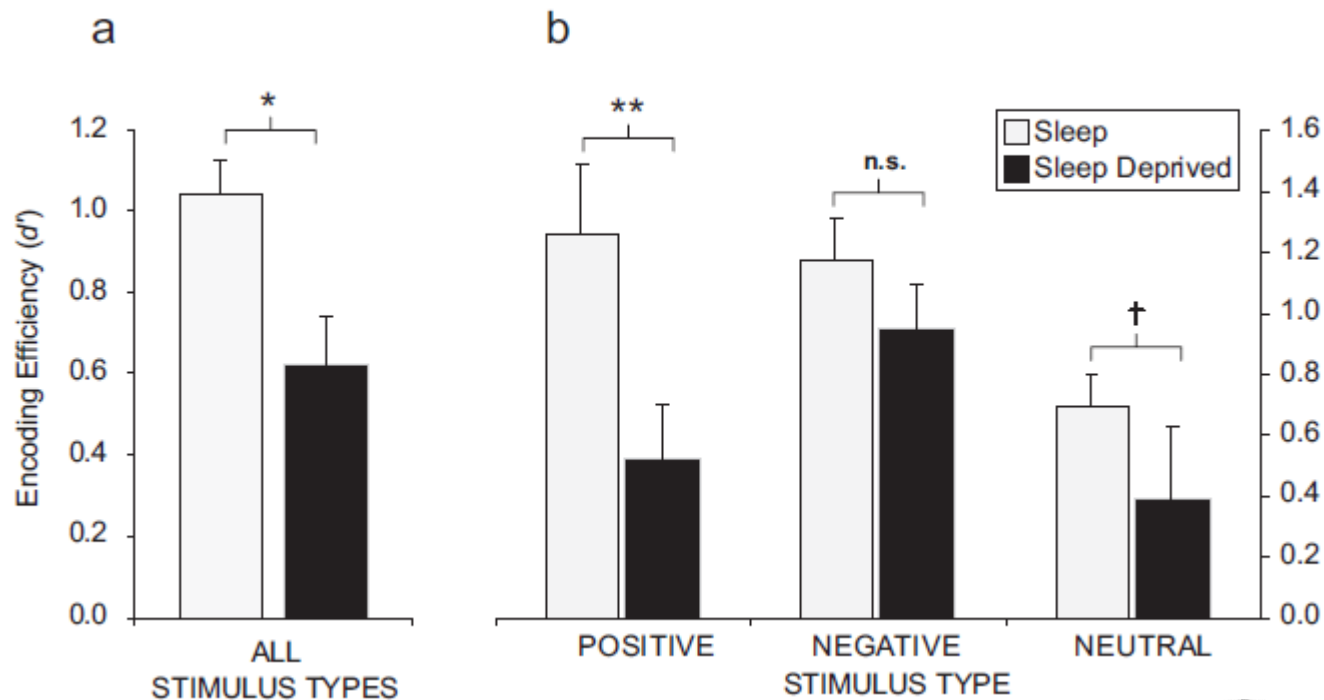
Plausibility	Is the association <u>consistent with other knowledge?</u> (mechanism of action; evidence from experimental animals)
Consistency	Have <u>similar results been shown in other studies?</u>
Strength	What is the <u>strength of the association</u> between the cause and the effect? (relative risk)
Dose-response relationship	Is <u>increased exposure</u> to the possible cause associated with increased effect?
Judging the evidence	How many lines of evidence lead to the conclusion?

Atividade cerebral durante o sono



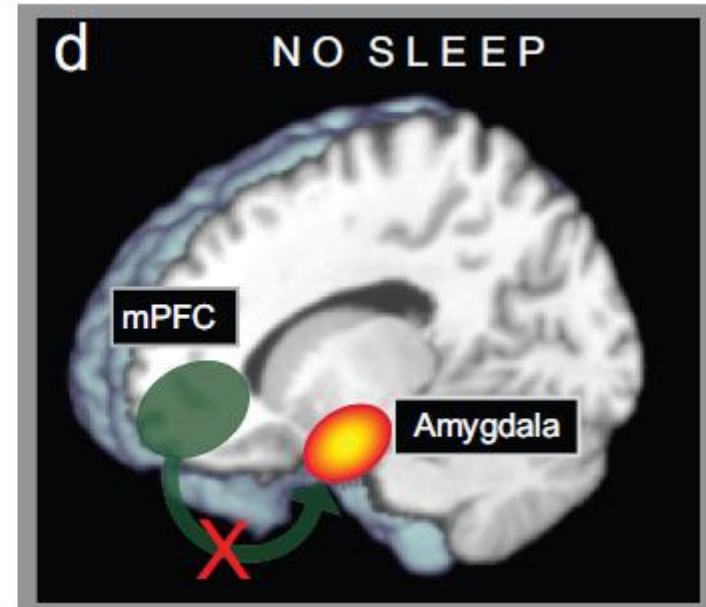
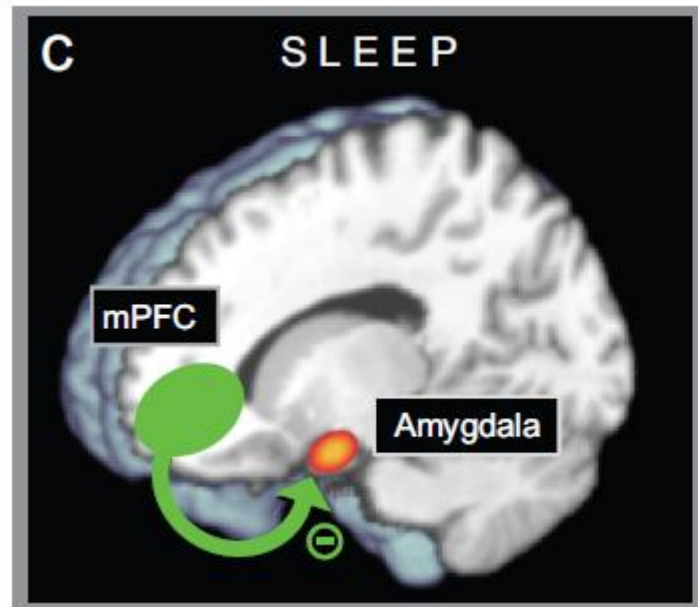
Overnight Therapy? The Role of Sleep in Emotional Brain Processing

Matthew P. Walker and Els van der Helm
University of California, Berkeley



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Inferência causal

Sono - Comportamento

Table 5.1. Considerations for causation

<u>Temporal relation</u>	Does the cause precede the effect? (essential)
Plausibility	Is the association <u>consistent with other knowledge?</u> (mechanism of action; evidence from experimental animals)
Consistency	Have similar results been shown in other studies?
Strength	What is the strength of the association between the cause and the effect? (relative risk)
Dose–response relationship	Is increased exposure to the possible cause associated with increased effect?
<u>Reversibility</u>	Does the removal of a possible cause lead to reduction of disease risk?
<u>Study design</u>	Is the evidence based on a strong study design?
Judging the evidence	How many lines of evidence lead to the conclusion?

Type of study	Ability to “prove” causation
<u>Randomized controlled trials</u>	Strong
Cohort studies	Moderate
Case-control studies	Moderate
Cross-sectional studies	Weak
Ecological studies	Weak



Estudos experimentais em crianças

Fallone, 2005

- **Crianças 6-12 anos**, aleatorizadas para sono otimizado (10h) ou privação (6,5 a 8h), 3 semanas; desenho cruzado
- Privação de sono associada a mais problemas sonolência, atenção, acadêmicos
- **Sem diferença na hiperatividade, impulsividade, oposição, tristeza, queixas somáticas, labilidade emocional**

Sleep restriction worsens mood and emotion regulation in adolescents.

[Baum KT](#)¹, [Desai A](#), [Field J](#), [Miller LE](#), [Rausch J](#), [Beebe DW](#).

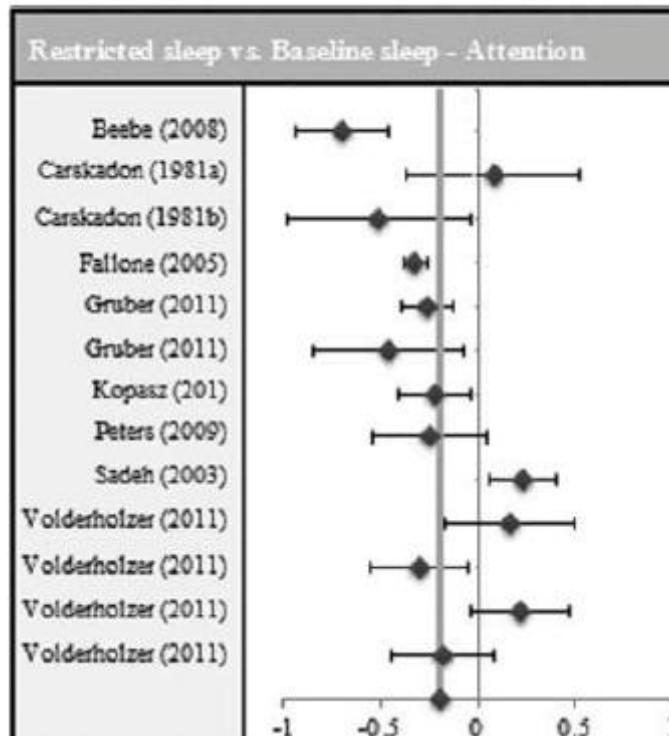
- **50 healthy adolescents, ages 14-17**
- 3-week sleep manipulation protocol involving a baseline week, followed by a sleep restriction (SR) condition (6.5 hr in bed per night for five nights) and healthy sleep duration (HS) condition (10 hr in bed per night for five nights).
- The study used a randomized, counterbalanced crossover experimental design. Participants' sleep was monitored at home via self-report and actigraphy.
- Participants averaged 2.5 more hours of sleep per night during HS
- **SR Adolescents rated themselves as significantly more tense/anxious, angry/hostile, confused, and fatigued, and as less vigorous** ($p = .001-.01$)
- **Parents and adolescents also reported greater oppositionality/irritability and poorer emotional regulation during SR**
- There were no cross-condition differences in depression or hyperactivity/impulsivity ($p > .05$).

[Dev Neuropsychol.](#) 2015;40(3):104-21. doi: 10.1080/87565641.2014.939183.

A Meta-Analysis of the Effect of Experimental Sleep Restriction on Youth's Attention and Hyperactivity.

[Lundahl A](#)¹, [Kidwell KM](#), [Van Dyk TR](#), [Nelson TD](#).

32 estudos, 17 amostra de indivíduos <18 anos, N=496

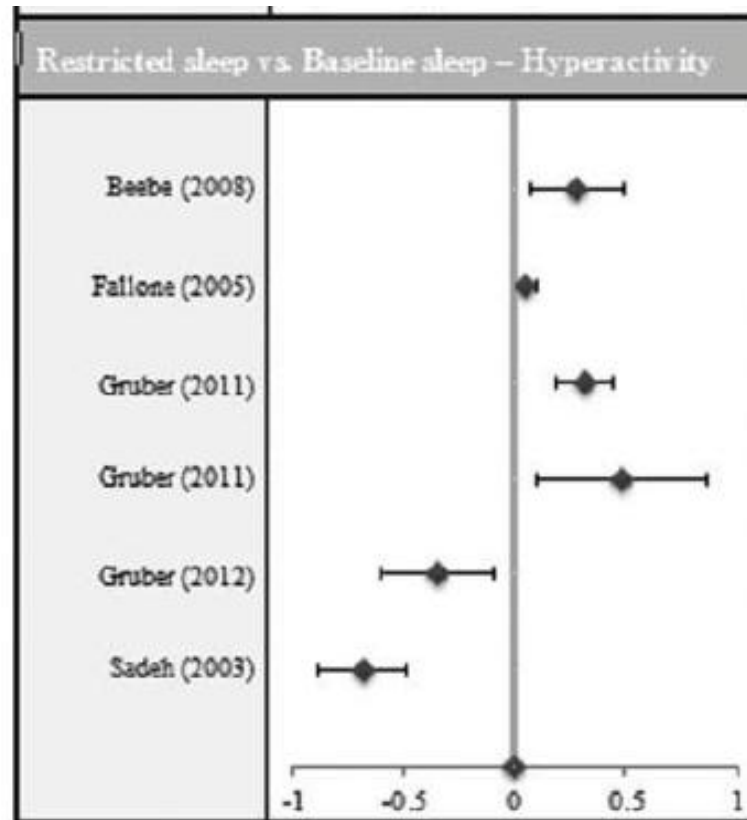


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Sono e comportamento

Causa ou consequência?

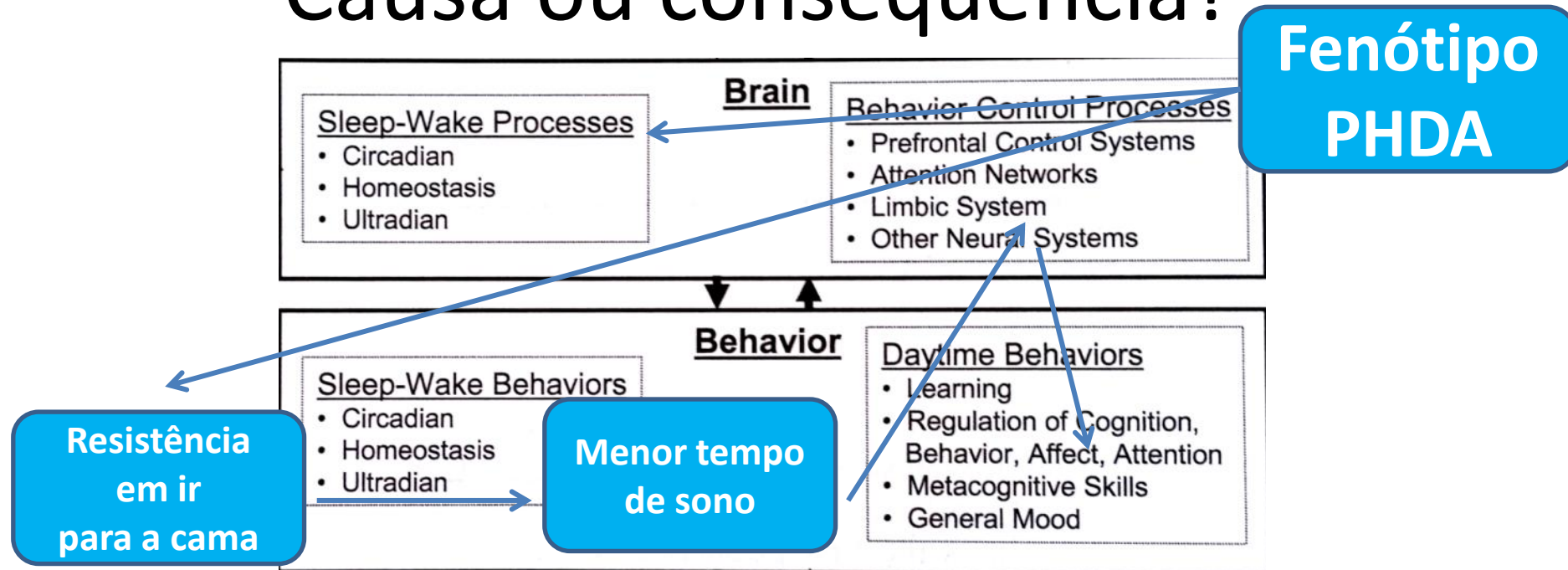
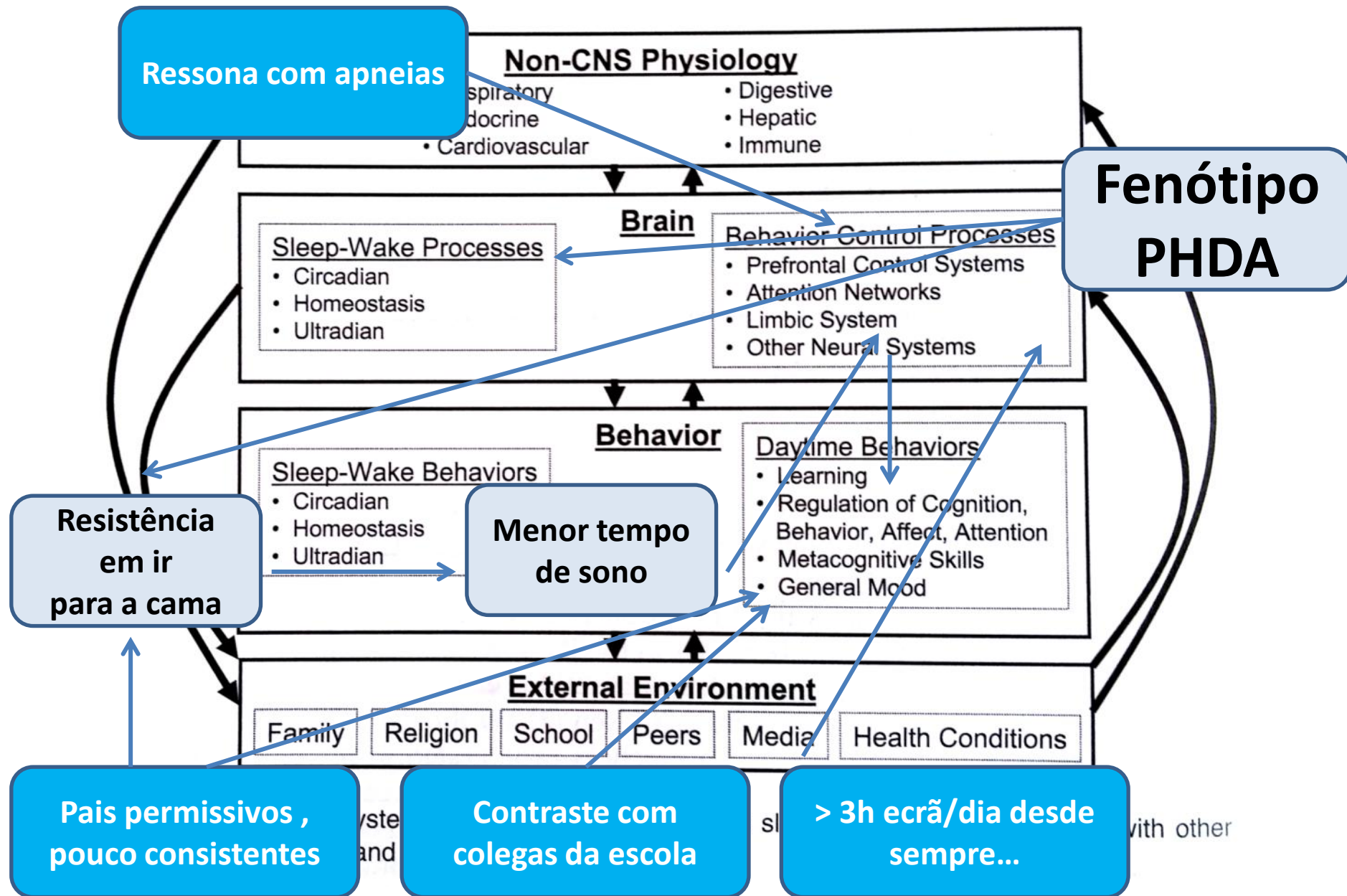


FIGURE 1 A multi-system heuristic model that relates sleep and daytime behaviors with other factors intrinsic within and external to a child.



O **sono** é fundamental para o **equilíbrio** homeostático, emocional, comportamental...



O **sono** é fundamental para o **equilíbrio** homeostático, emocional, comportamental...



Saúde
dos pais

Afeto

Rotinas

Horários

Necessidades

Regras

Prioridades

Tempo de
qualidade

Hábitos

Segurança

Sono



Obrigado!

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