

心理健康與親子關係

---心理健康與人際關係之神經生理觀點

楊延光 院長/特聘教授/醫師

衛福部臺南醫院

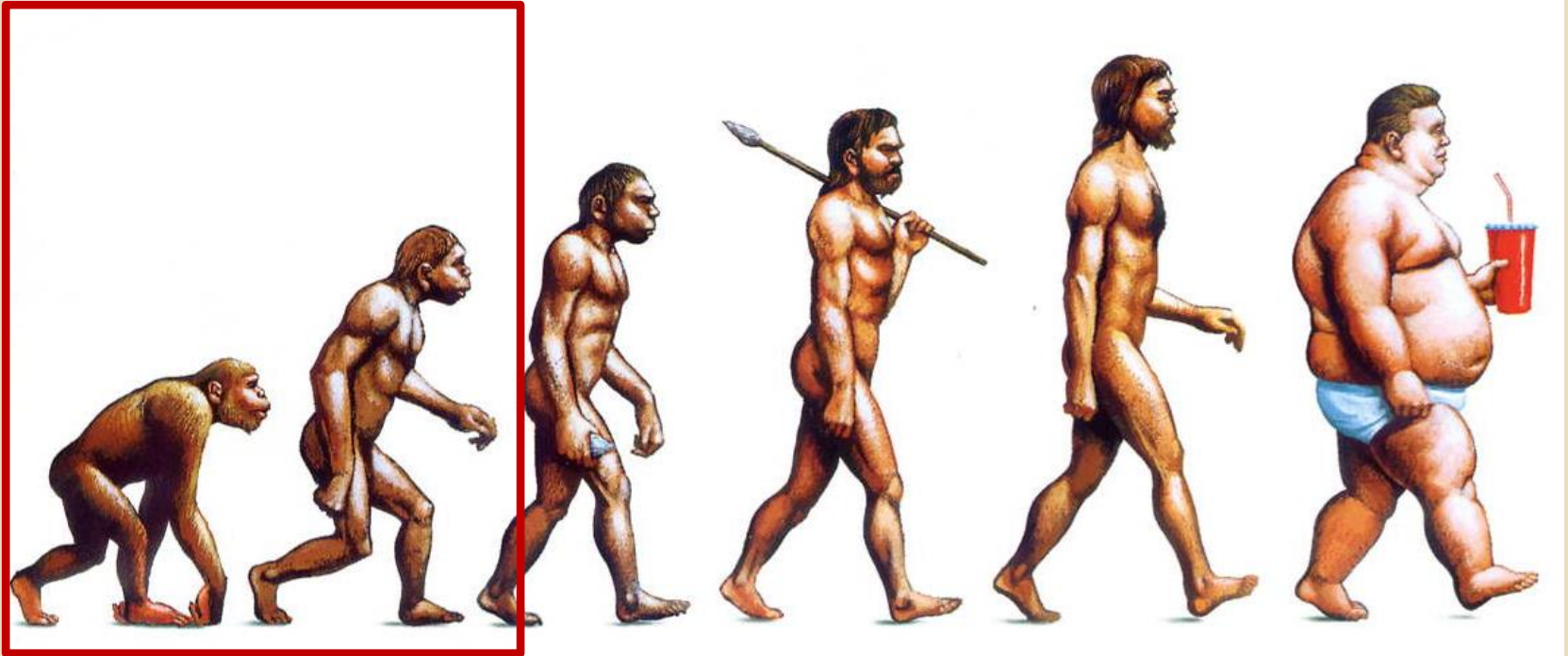
成大醫學院附設醫院/精神科/行為醫學研究所



大 綱

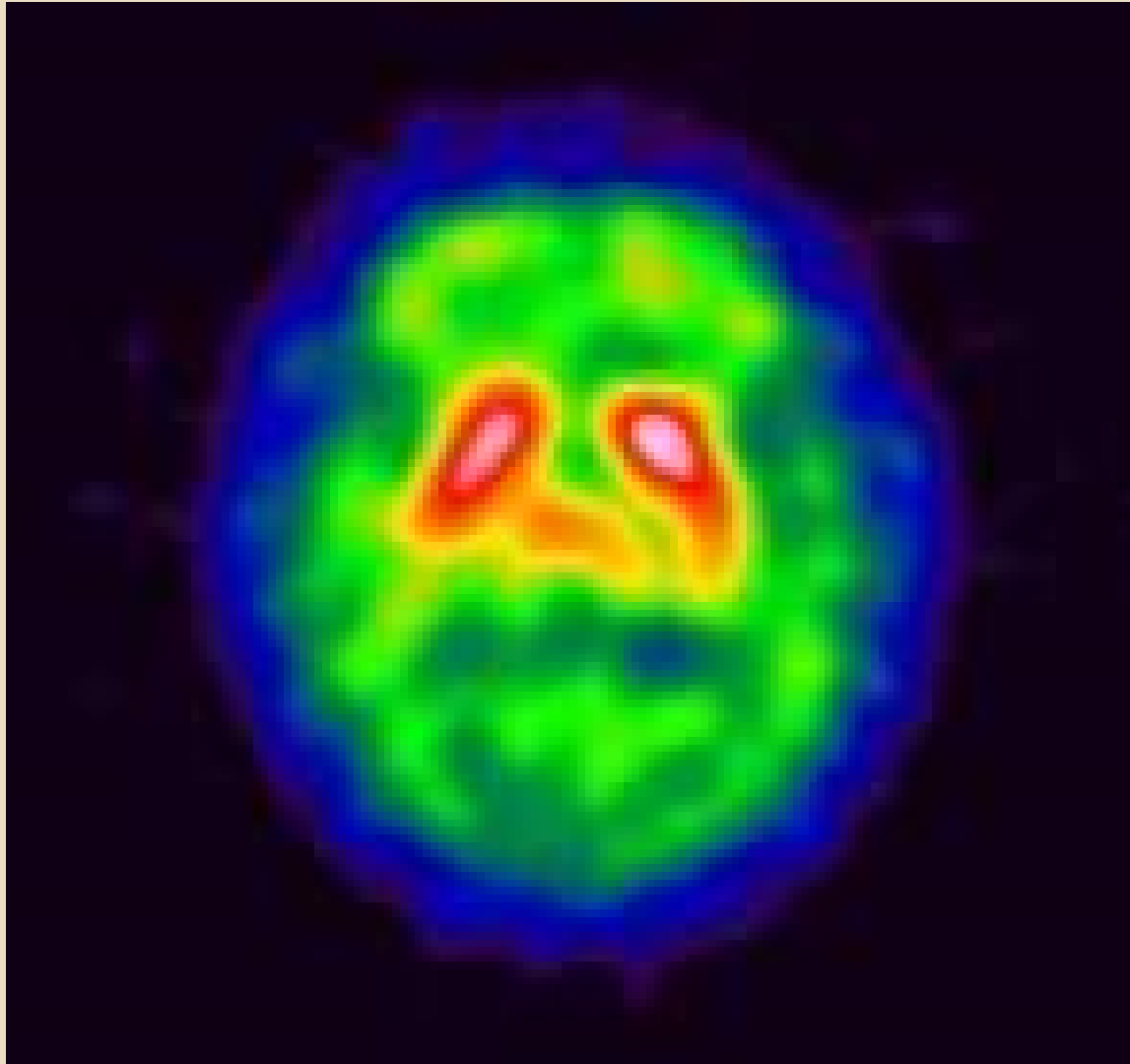
- 人際/親子關係/支持之意涵
- 記憶之形成
- 情緒與壓力之關係
- 優化腦力:睡眠/正念/運動之影響
- 淺見參考

The Evolution of Human, 演化?

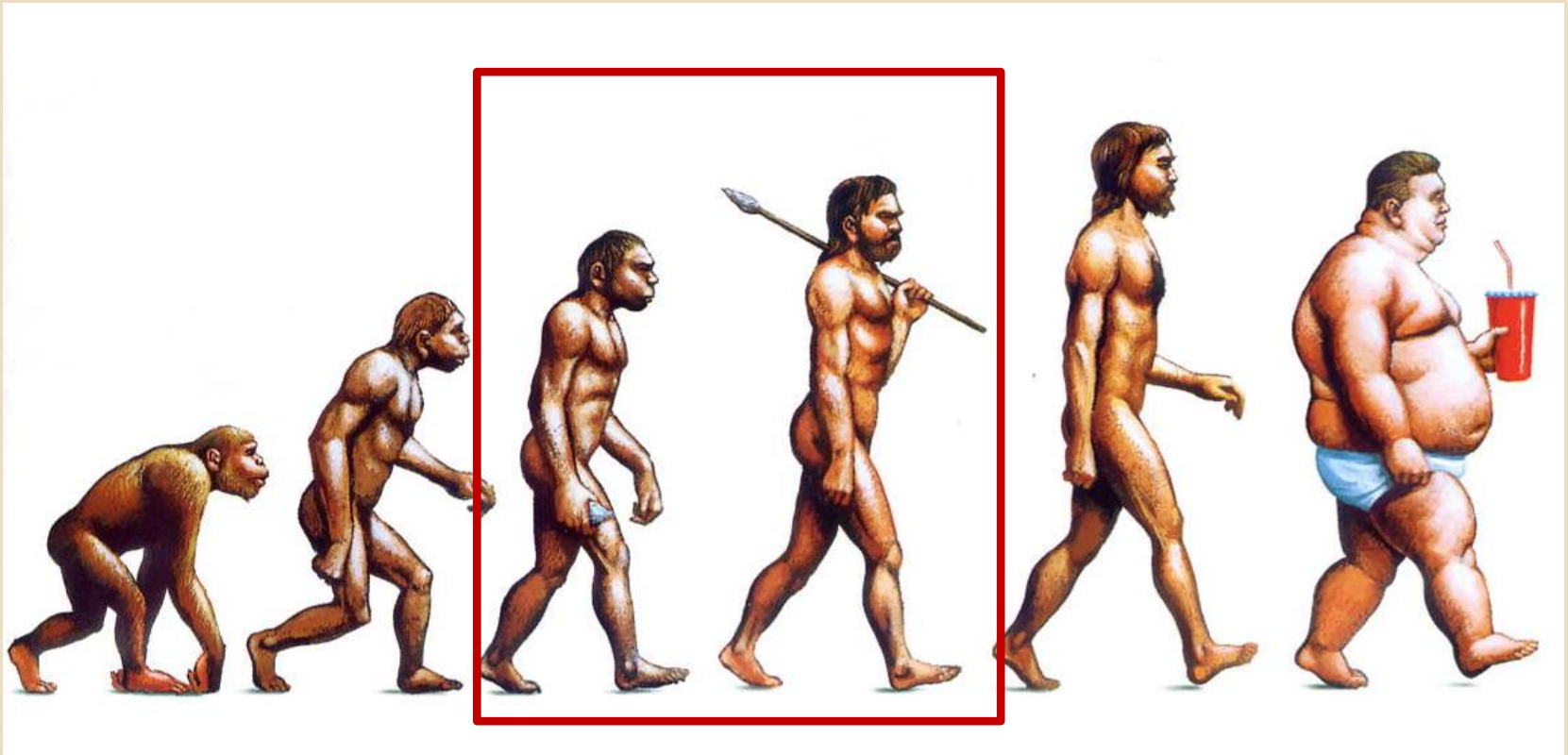


[¹²³I]IBZM (for D2 receptor, 多巴胺接受體)

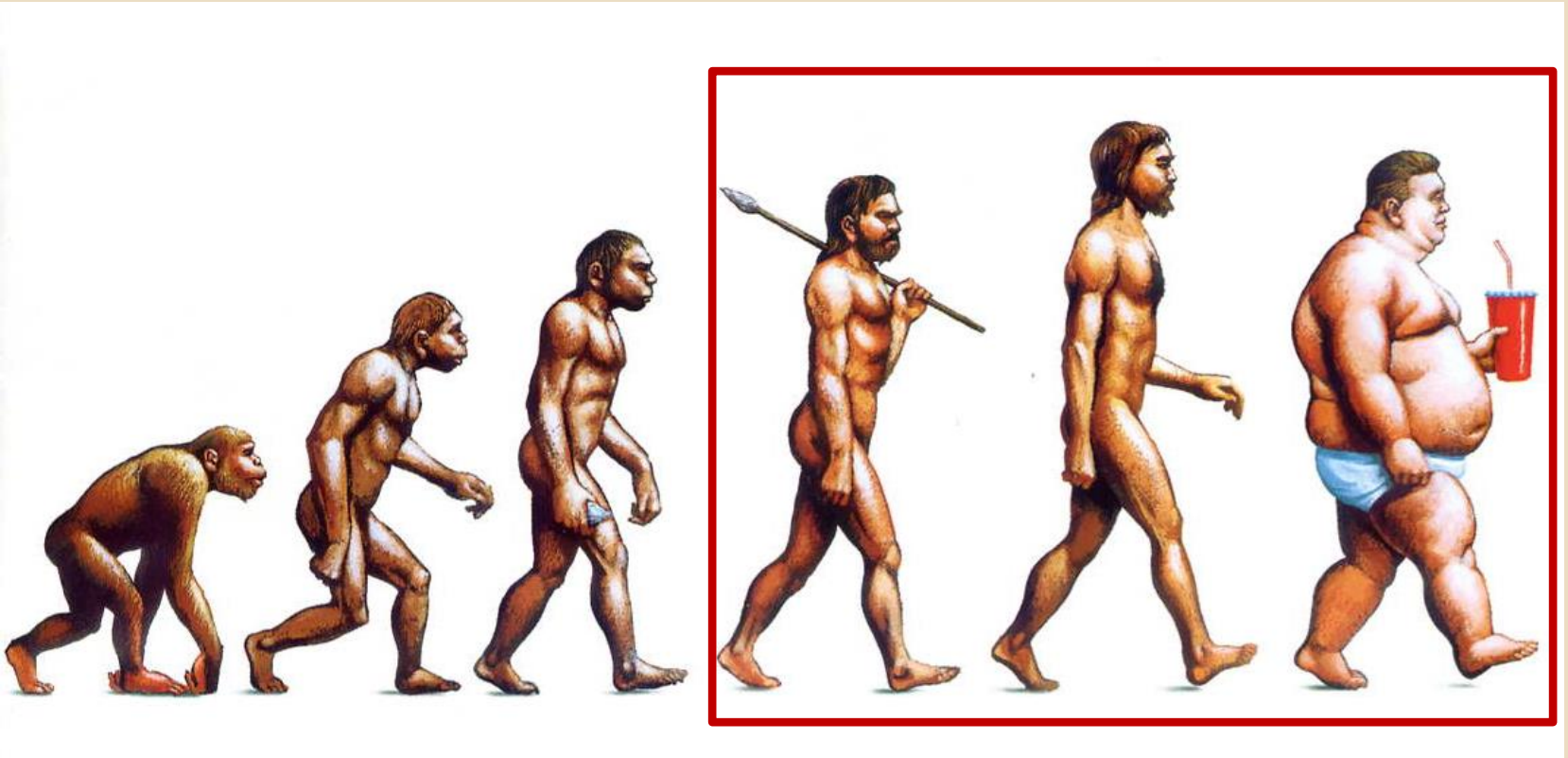
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The Evolution of Human ?

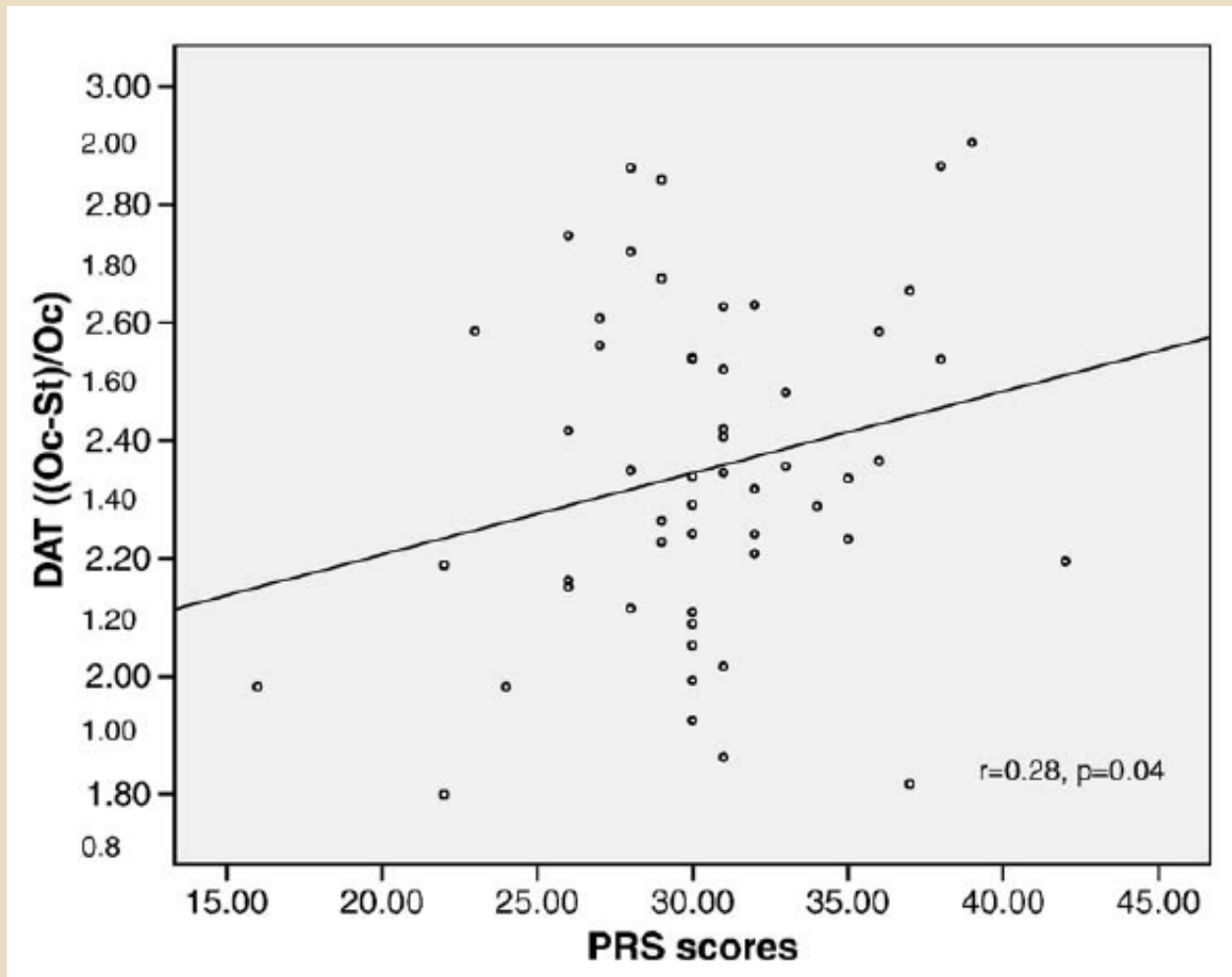


The Evolution of Human ?



多巴胺(dopamine)的高低與人類的社會支持度有關

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Yeh et al, Progress in Neuro-Psychopharmacology & Biological Psychiatry 2009

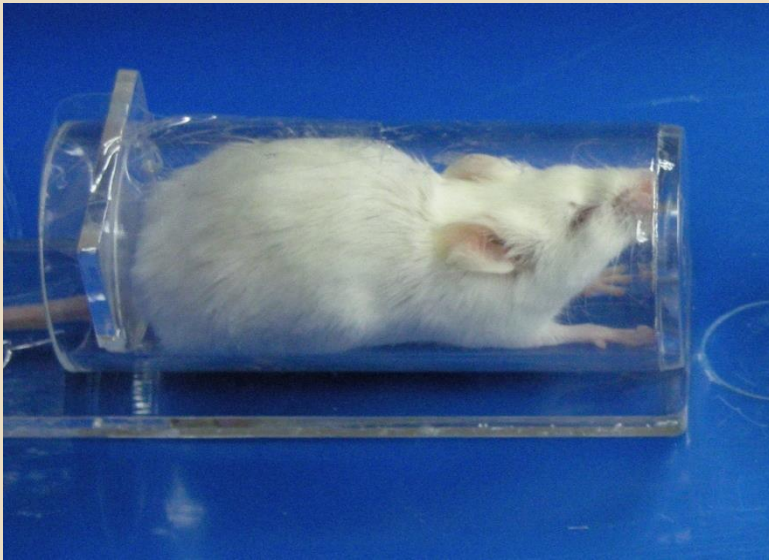
多巴胺與大腦發展相關的研究

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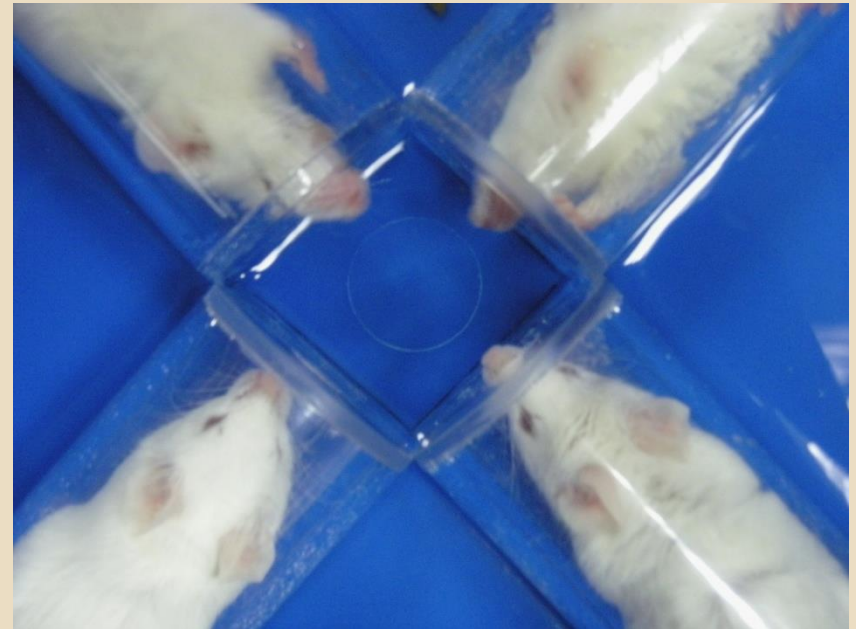
- **DA and fine motor activities:** Yang et al Psychiatry Research Neuroimaging 2004
- **DA and cognitive function:** Chen PS et al Psychological Medicine 2005; Gou GF et al Psychological Medicine 2006; Hsieh PC et al Journal of Psychiatry and Neuroscience 2010
- **DA and body weight:** Chen PS et al NeuroImage 2008
- **DA and social support:** Yeh TL Progress Neuropsychopharmacology and Biological Psychiatry 2009

相關的研究無法進行廣泛的推論—動物模式有助於因果關係的確定-- Constraint (in water)

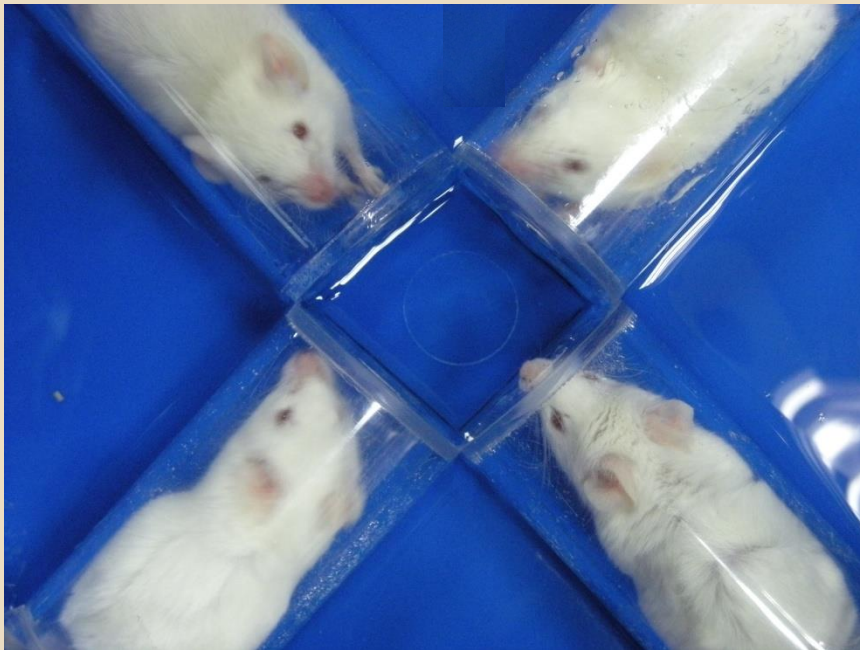
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Cherng et al 2010



From the same cage (familiar) Cherng et al 2010

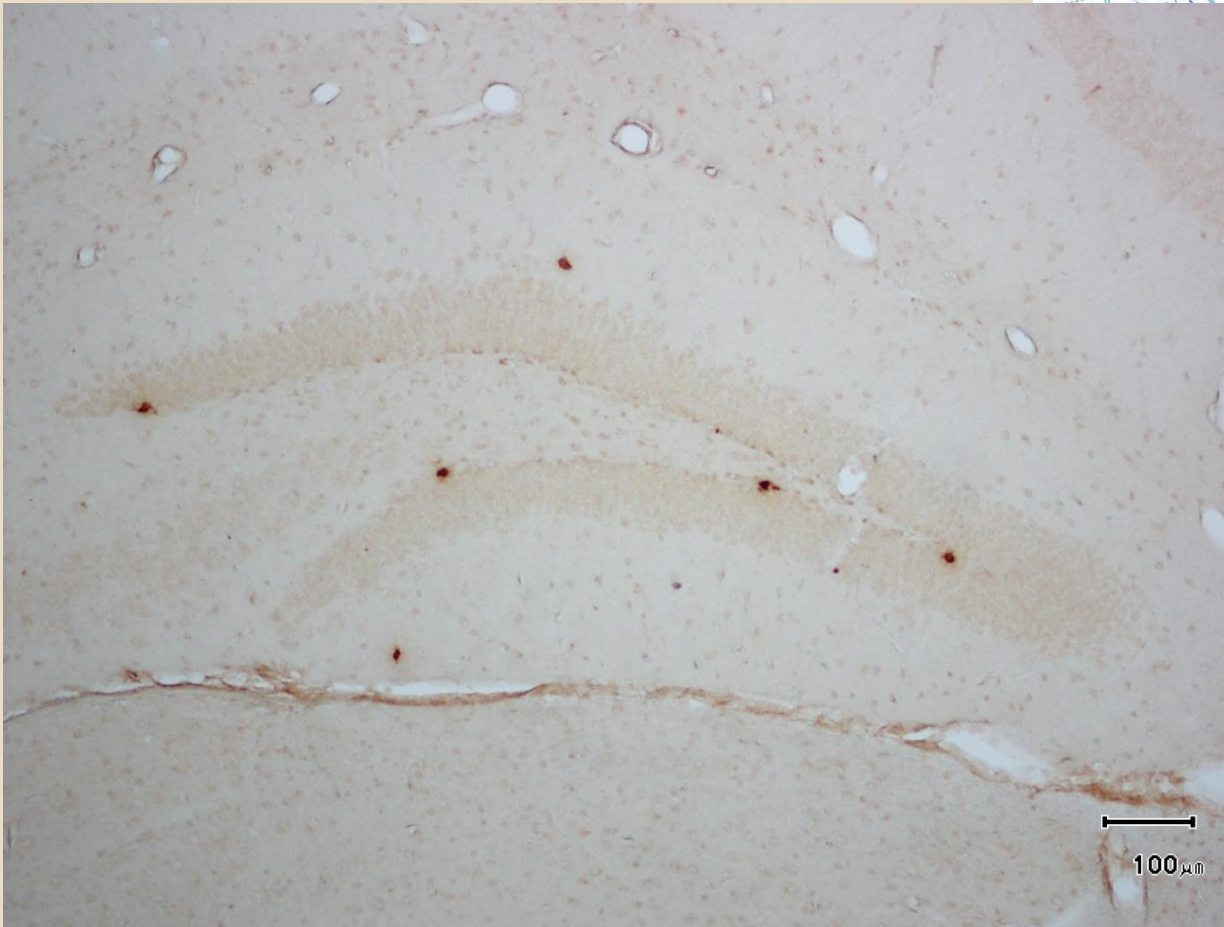
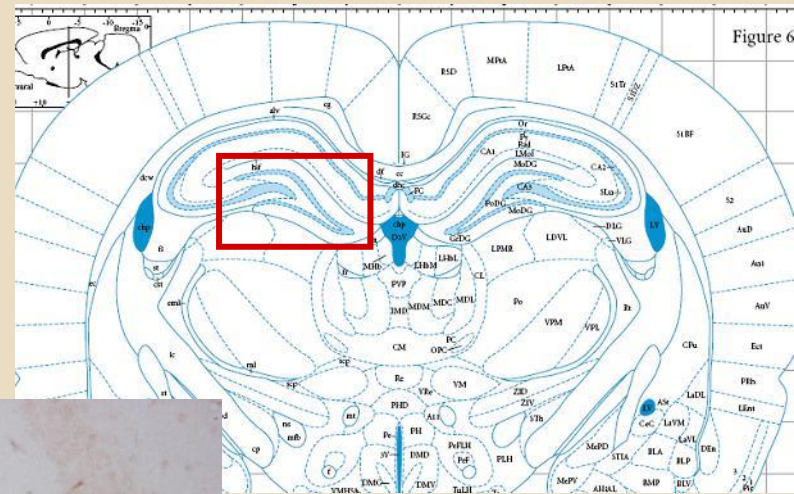


From different cages (unfamiliar)

BrdU immunohistochemistry

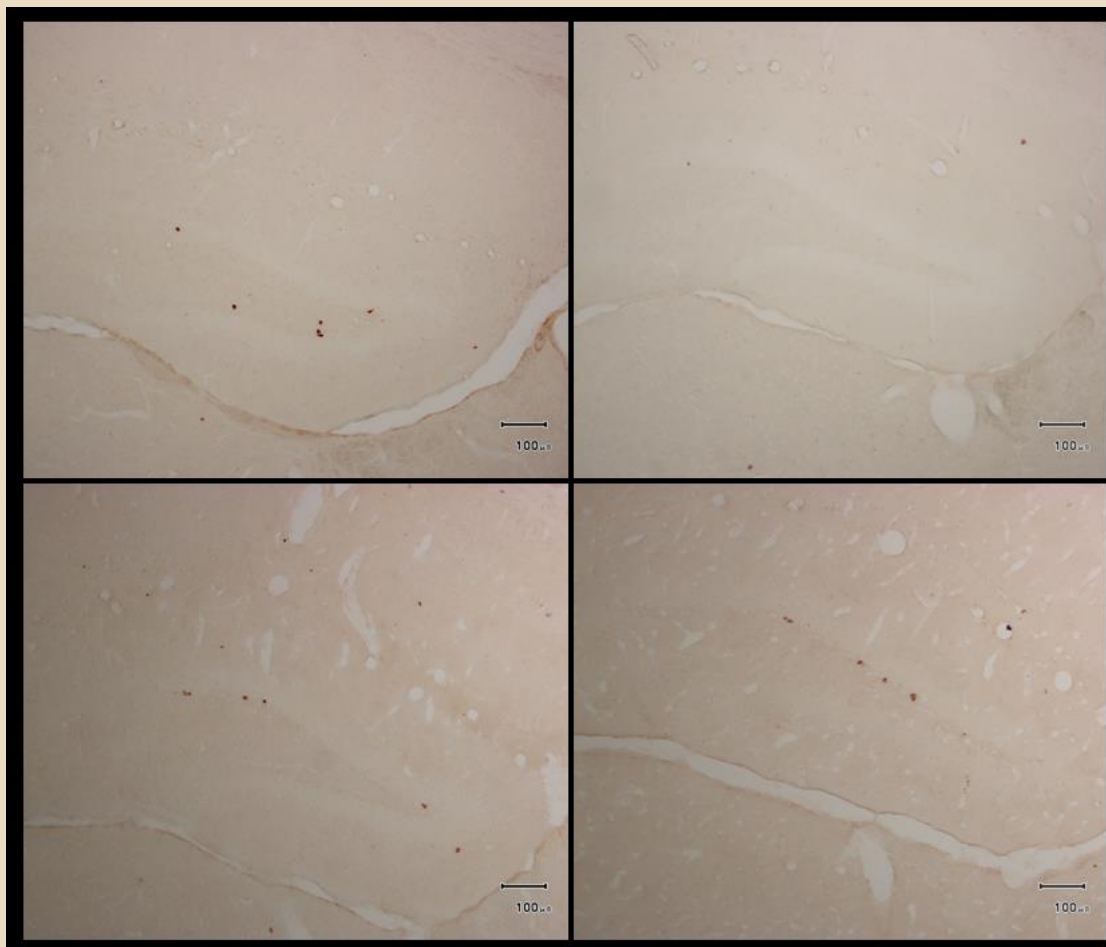
沒壓力時神經細胞會再生

Dentate gyrus (DG)



同舟共濟有道理嗎？

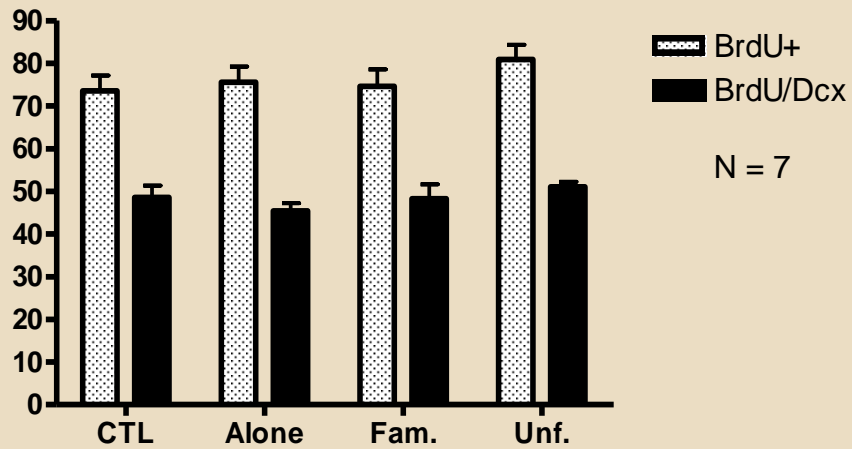
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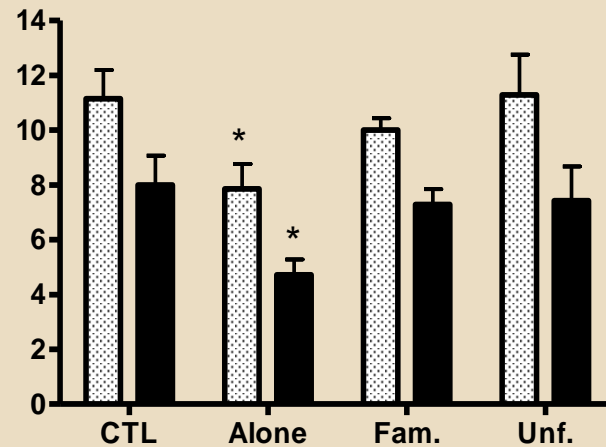


Odor?

SVZ

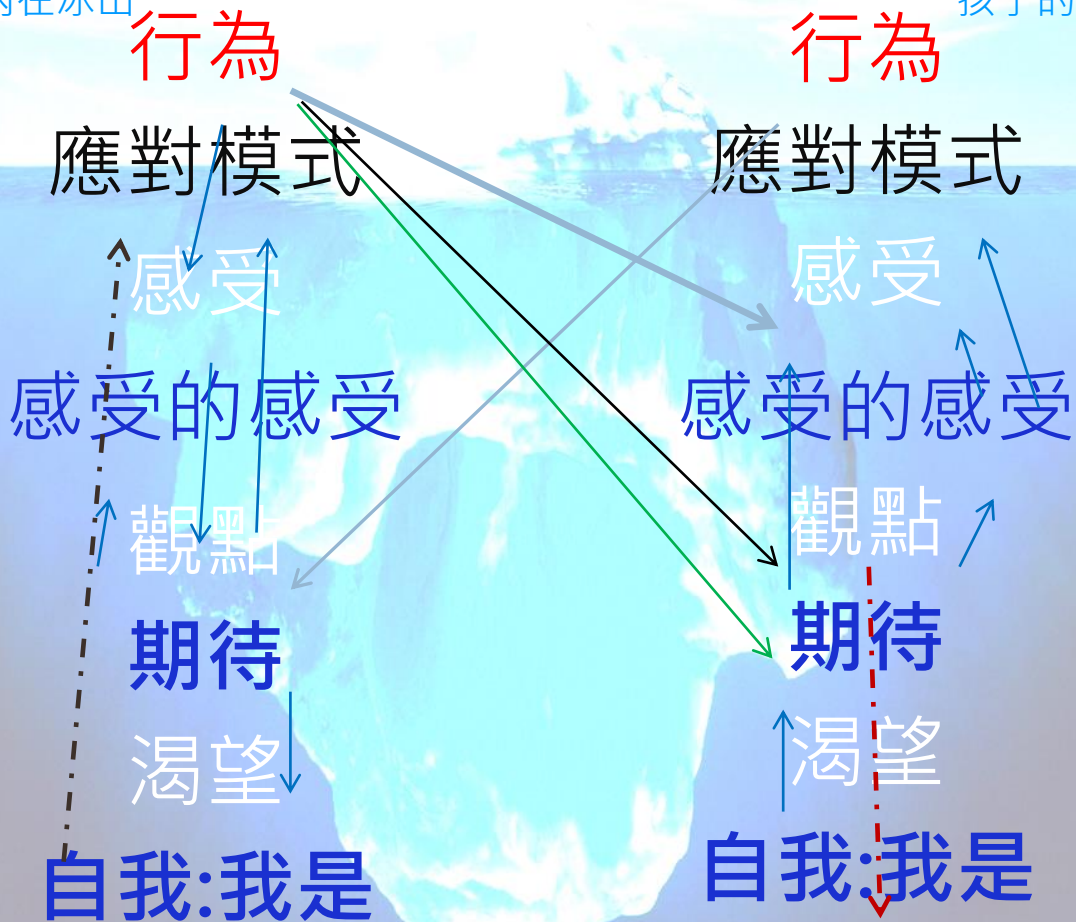


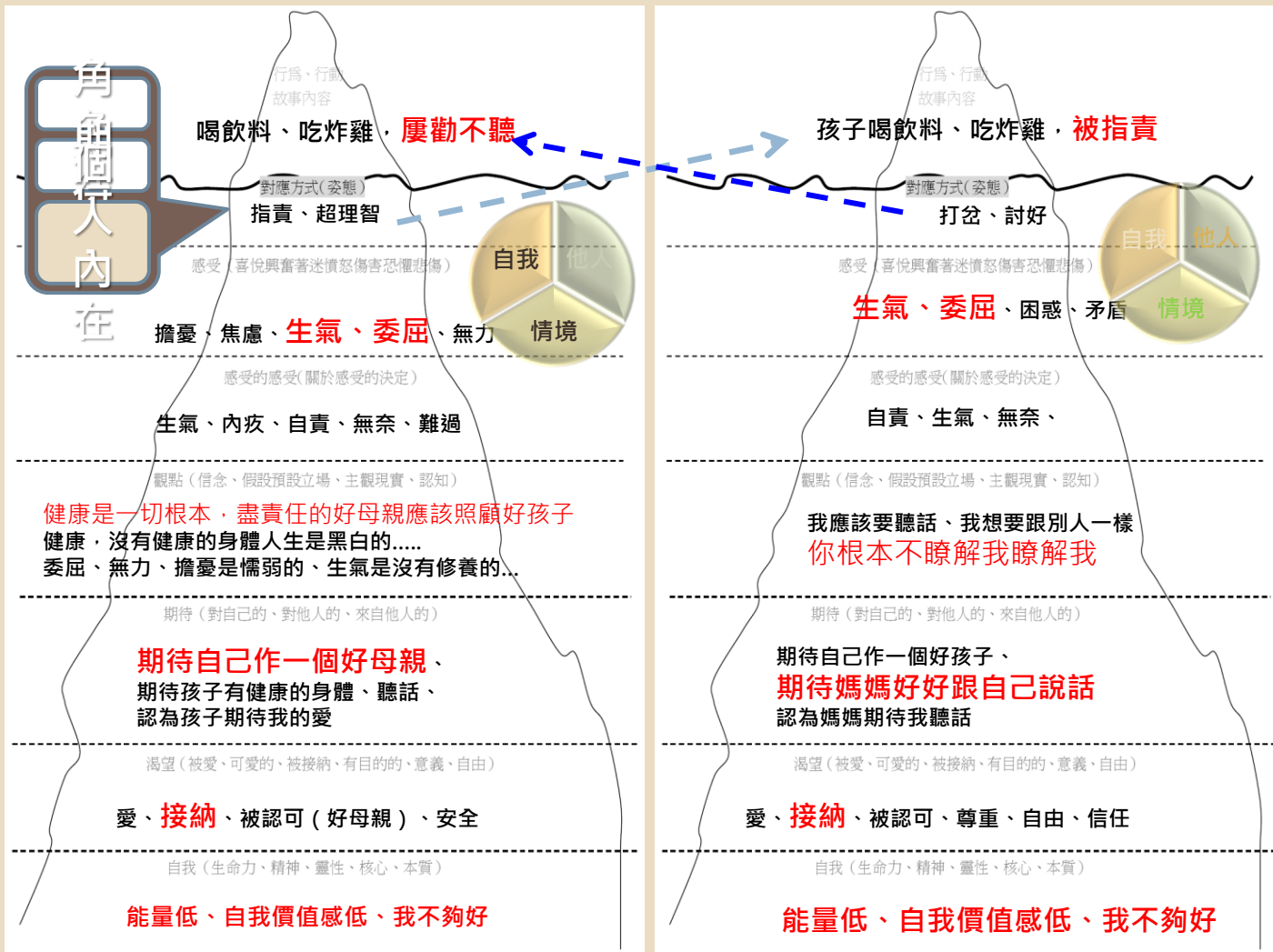
DG



父/母的內在冰山

孩子的內在冰山





大 綱

- 人際關係 / 支持之意涵
- 記憶之形成
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- 優化腦力：睡眠 / 運動之影響
- 淺見參考

2000諾貝爾醫學獎得主

(**曲高和寡**_(天馬行空)、**高瞻遠矚**_(飛龍在天)、**學以致用**_(禿鷹俯衝))



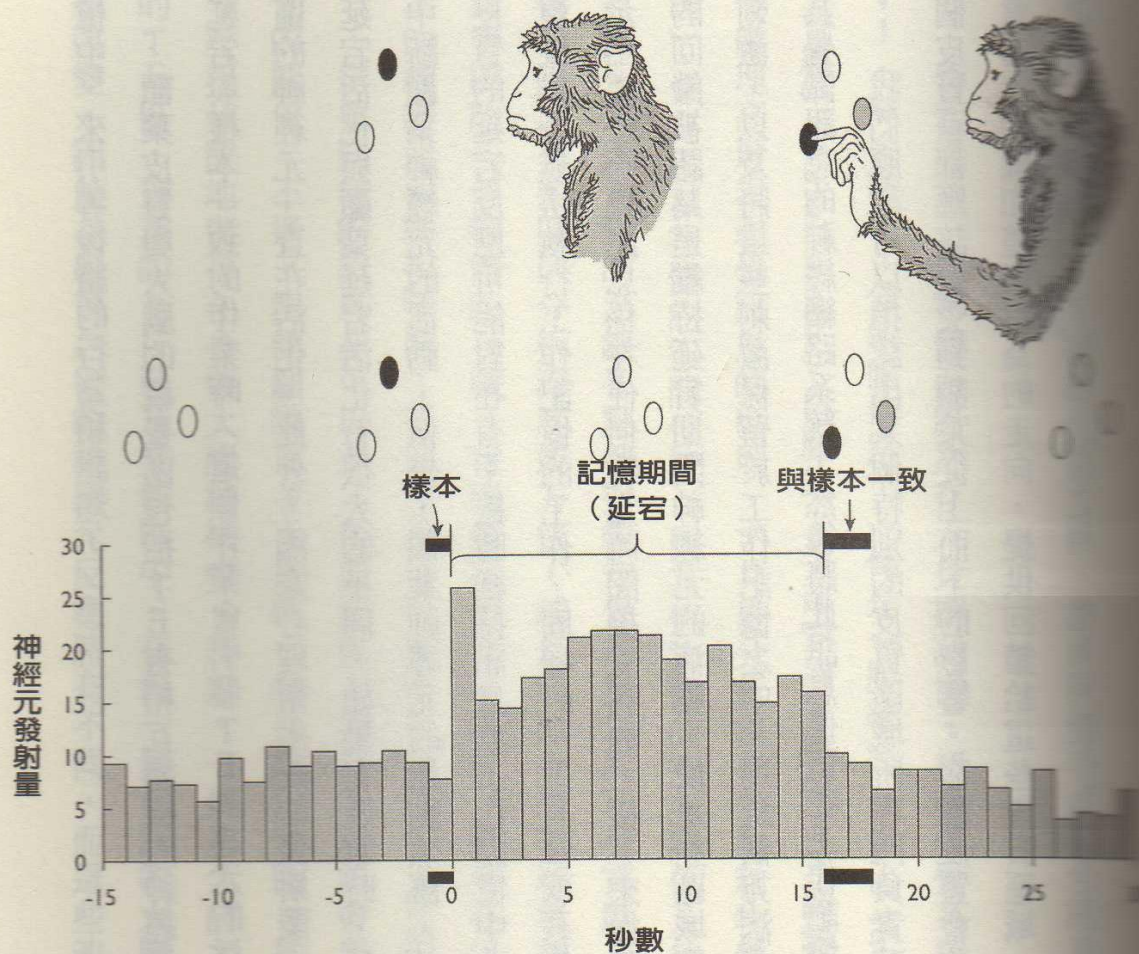
ERIC KANDEL



PAUL GREENGARD

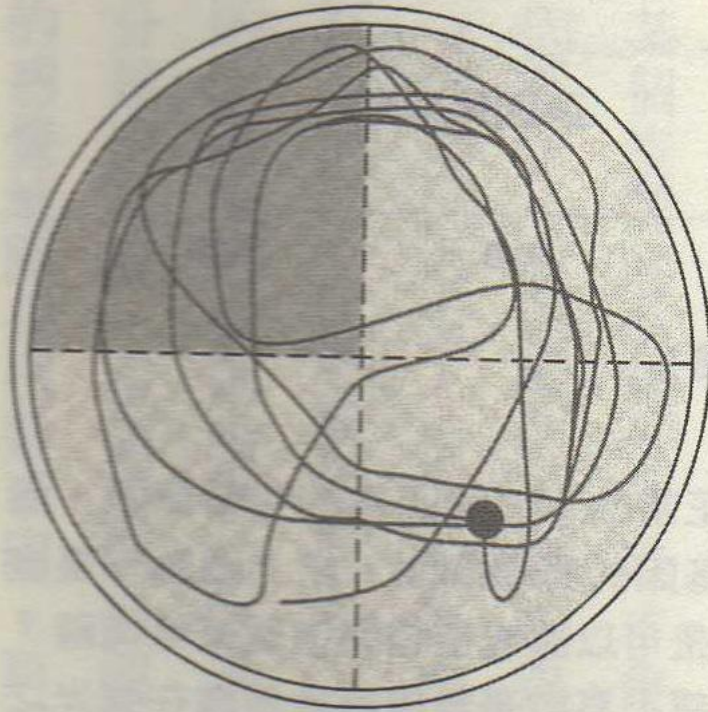


ARVID CARLSSON



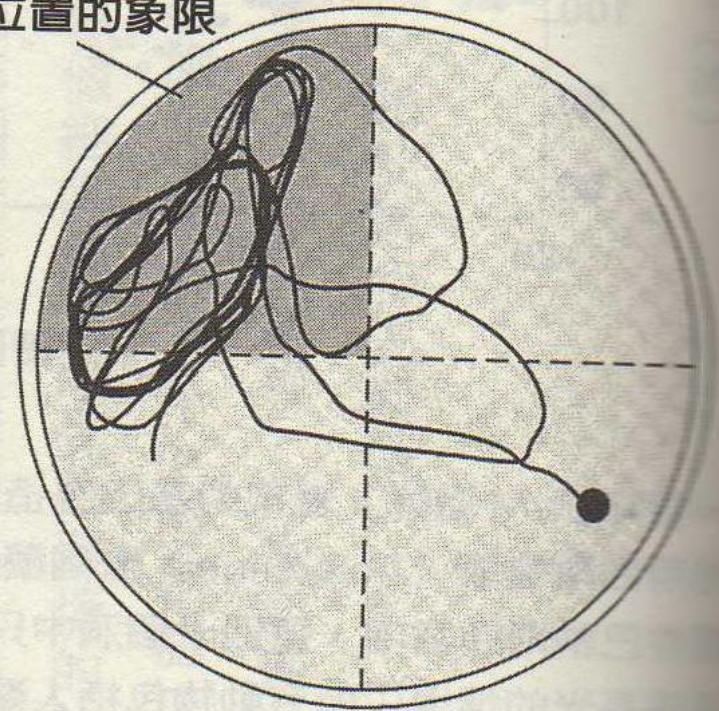
工作記憶的神經活動情形。在進行延宕與樣本符合的作業時，猴子必須記得樣本的颜色（黑色），經過一段時間（記憶期）之後，才能正確的選出答案。下圖為TE皮質神經元活動的情形（記憶期為十六秒）。在記憶期結束時，兩個顏色（黑色和灰色）都出現，猴子不需要再將黑色維持在記憶中，因此此時細胞的活動便降回基準線了。

突變鼠



正常自然鼠

平台位置的象限



在老鼠學會平台的位置後，實驗者將平台移走，一隻已經學會這個作業的正常老鼠會花較多（與機率相較）的時間在平台原來出現的位置區域中尋找，而一隻經基因改造的老鼠則漫無目的地到處尋找，在每一個象限所花的時間一樣，好像不記得平台的位置。

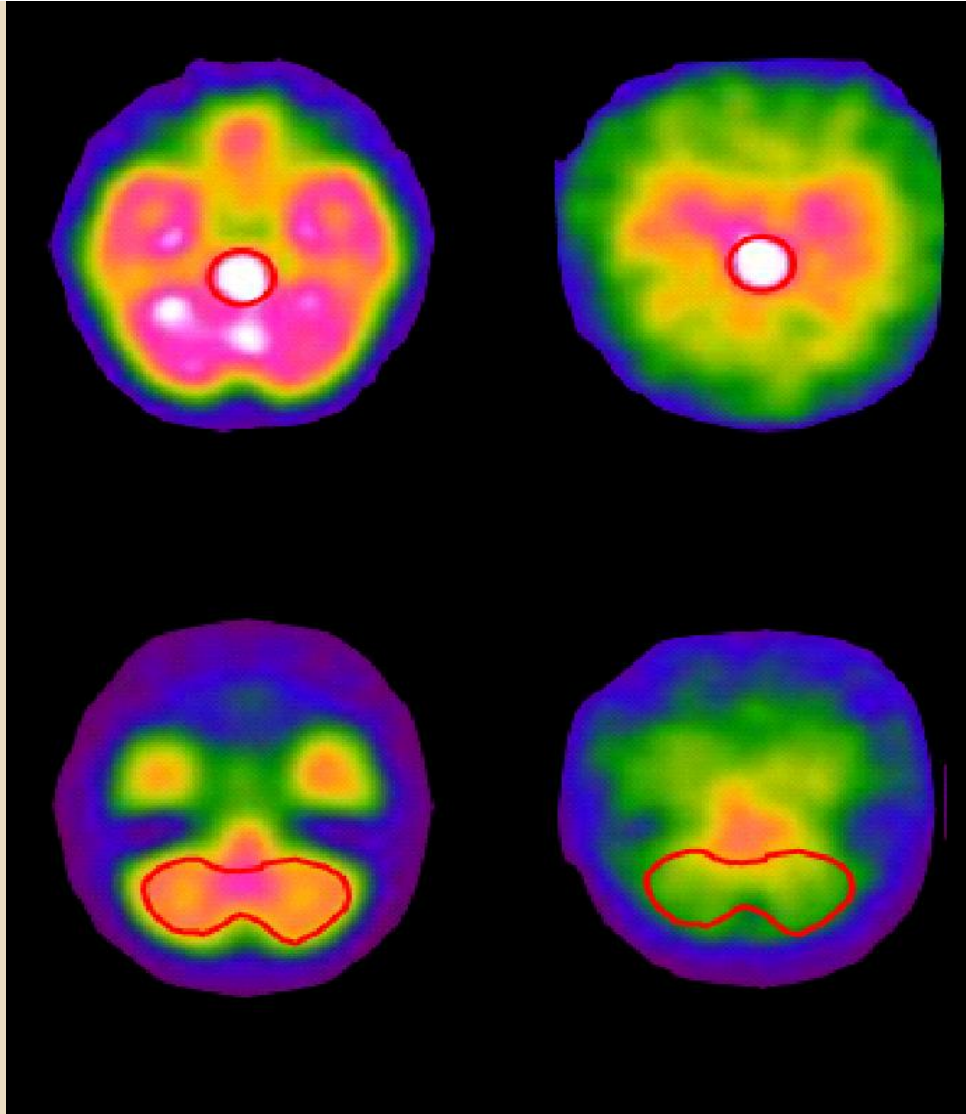
大 綱

- 人際關係 / 支持之意涵
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- 優化腦力：睡眠 / 運動之影響
- 淺見參考

[¹²³I] ADAM (5HT transports, SERT)血清激素 (serotonin)

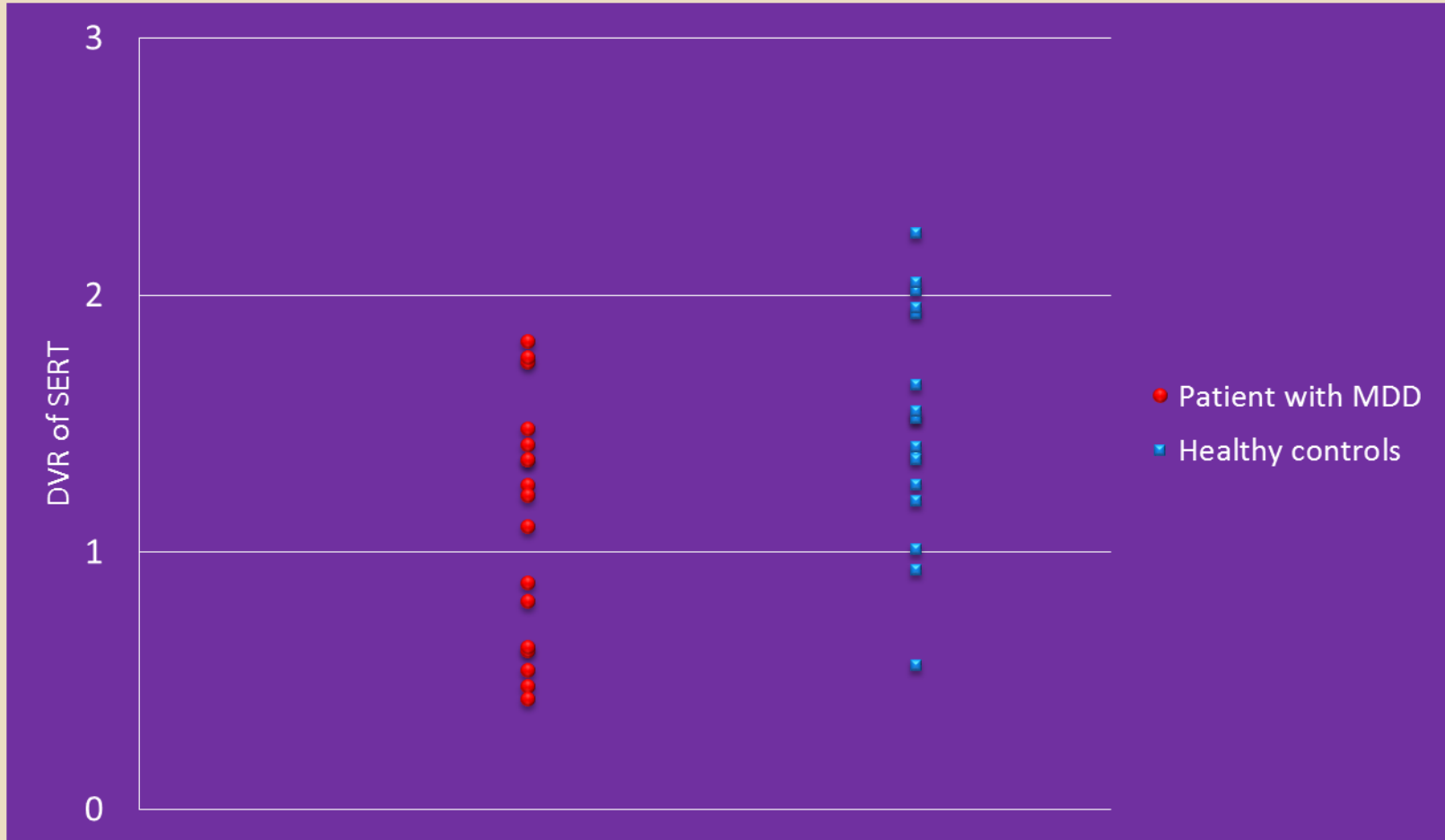
問這世間情是何物?

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Lower serotonin transporter in MDD(重鬱症)

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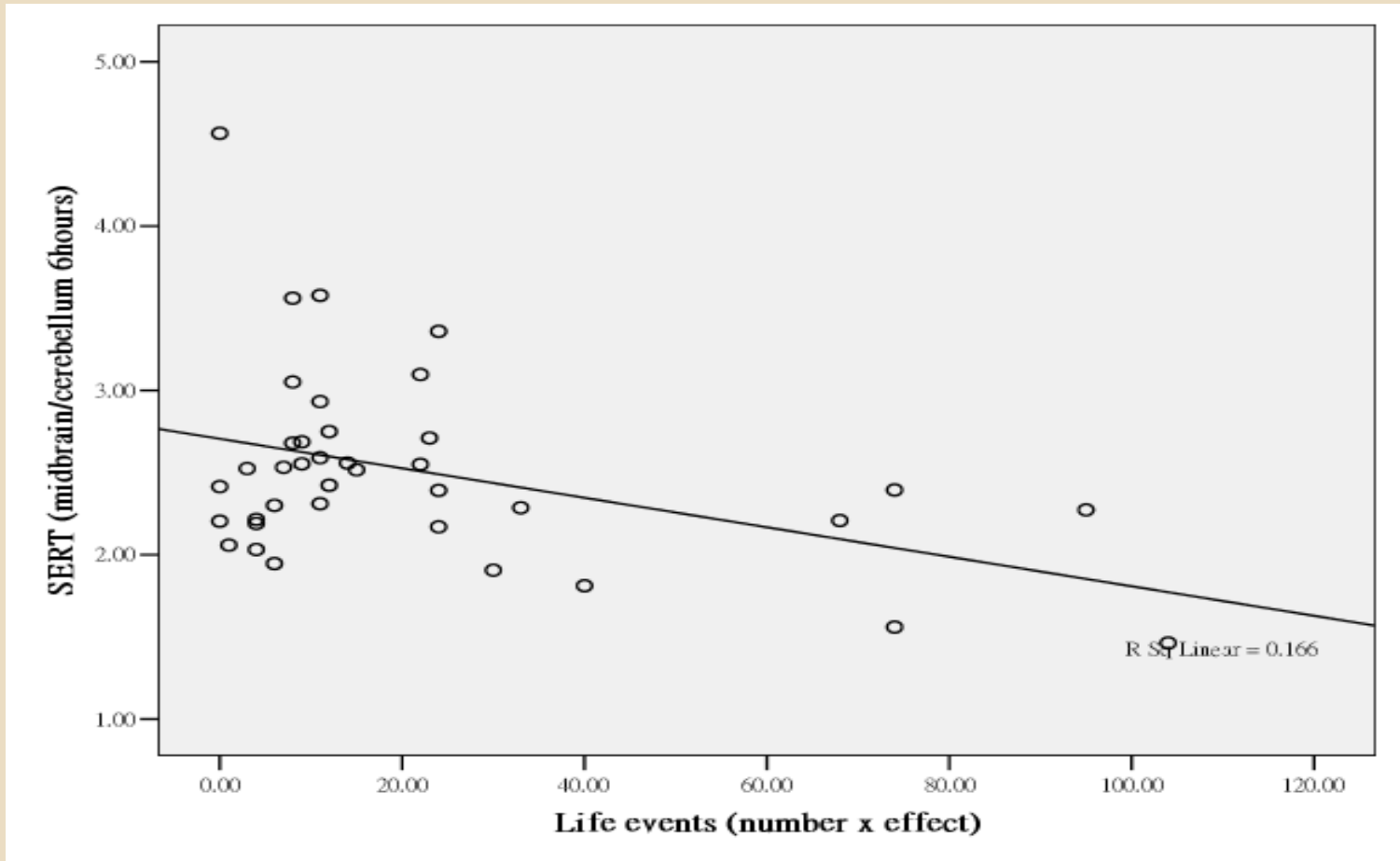


(Tasi et al Pharmacopsychiatry 2015) (n=17, p=0.019)

The correlation between SERT availability and life events

生活壓力會導致血清素下降

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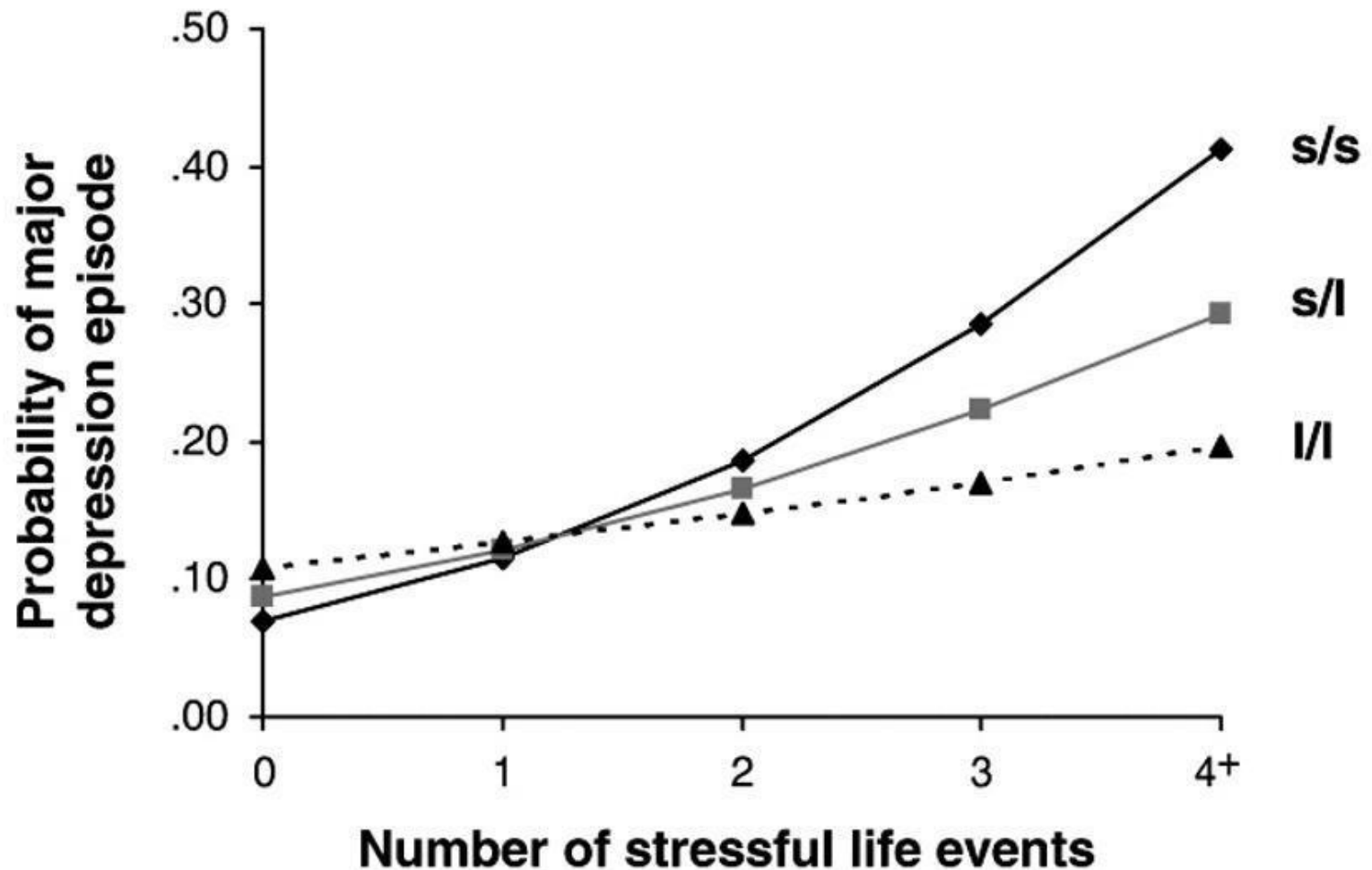


Yeh et al., NeuroImage 2009

疾病是體質與不良環境互動的結果

(Caspi et al Science 2003)

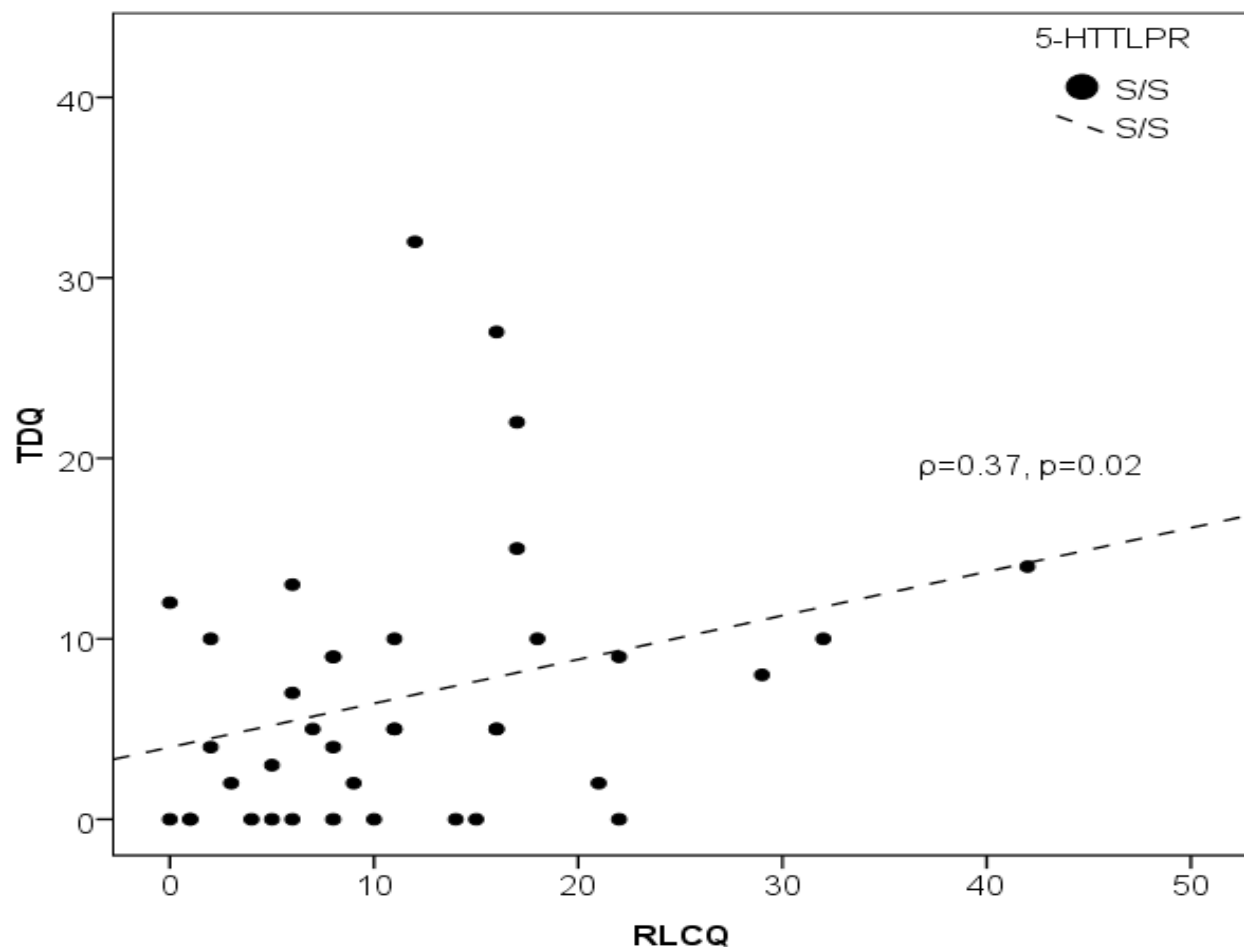
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壓力較大一定會引起情緒不穩定嗎?-基因?

(S/S, 落井下石型基因)

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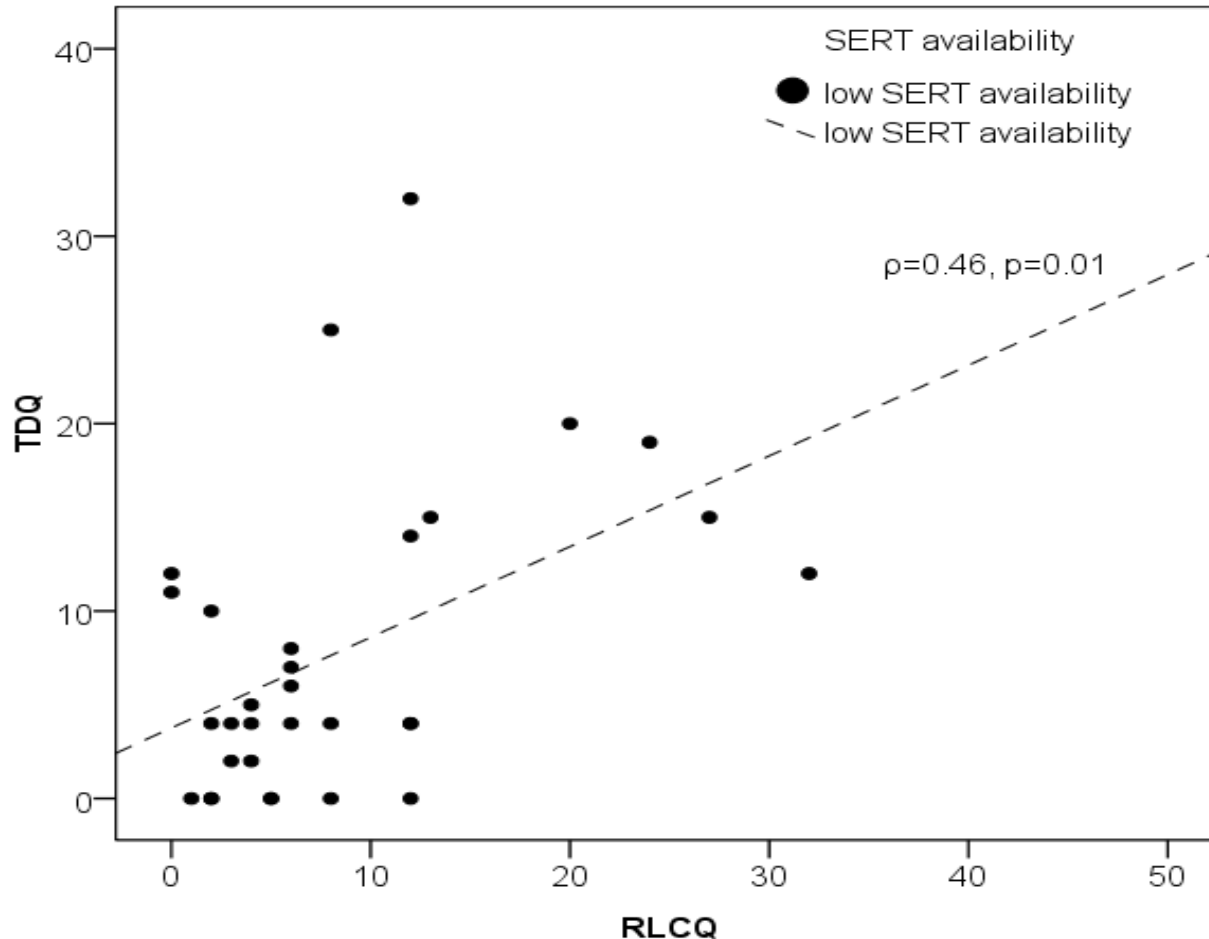


壓力較大一定會引起情緒不穩定嗎？

-基因決定了一切嗎？

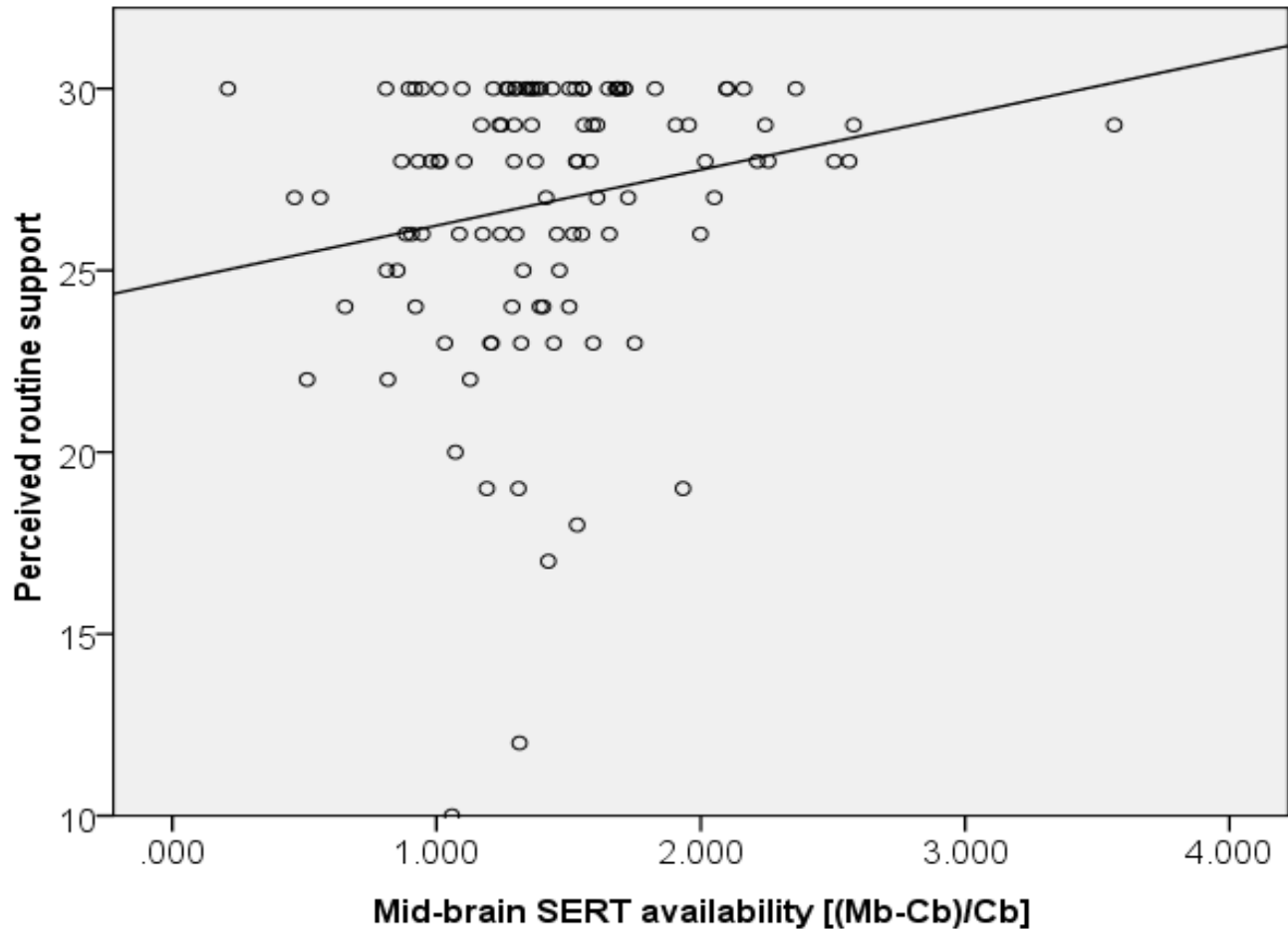
(low SERT availability)

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人類的社會支持度高低與腦內血清激素(serotonin)有關

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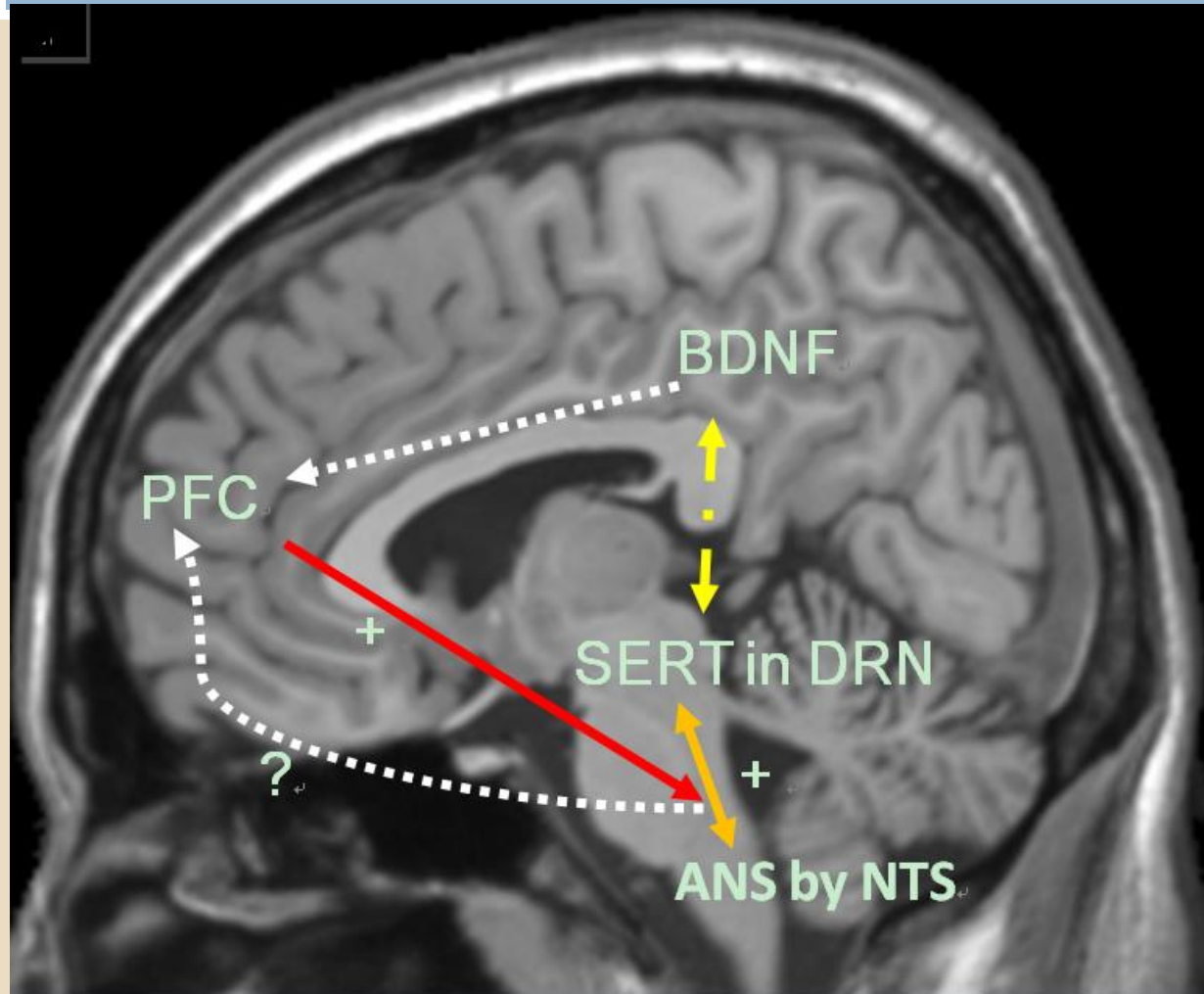
Huang H Y et al., J Psychosomatic Res 2013

大 網

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- 人際關係 / 支持之意涵
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Interaction between the PFC, SERT, ANS and BDNF level--- Possible top-down regulation from the PFC



PFC: prefrontal cortex

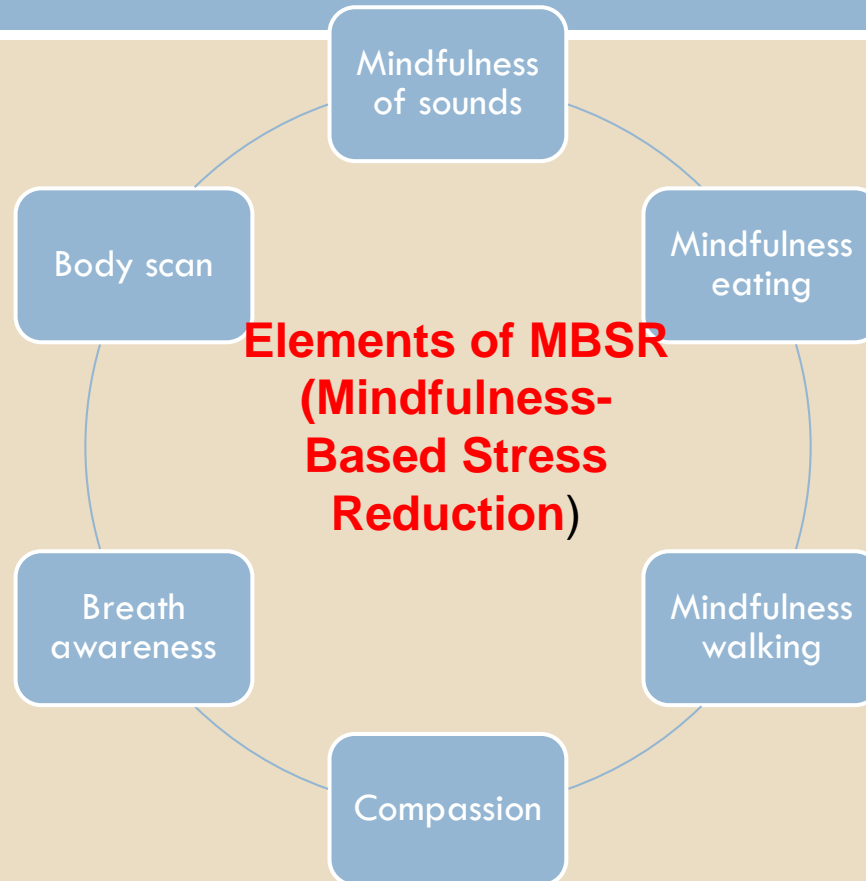
SERT: serotonin transporter

ANS: autonomic nervous system

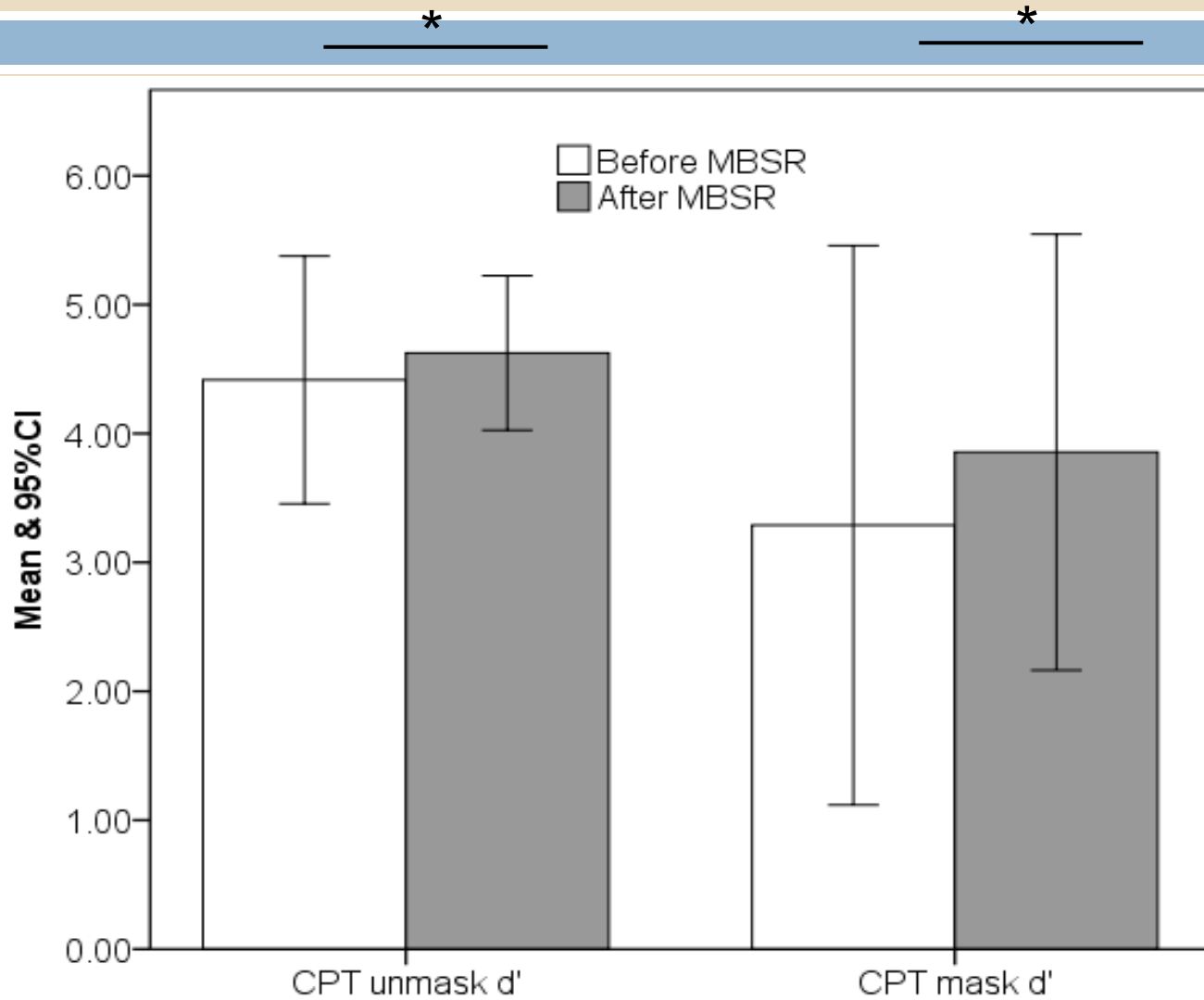
BDNF: brain-derived neurotrophic factor

DRN: dorsal raphe nucleus

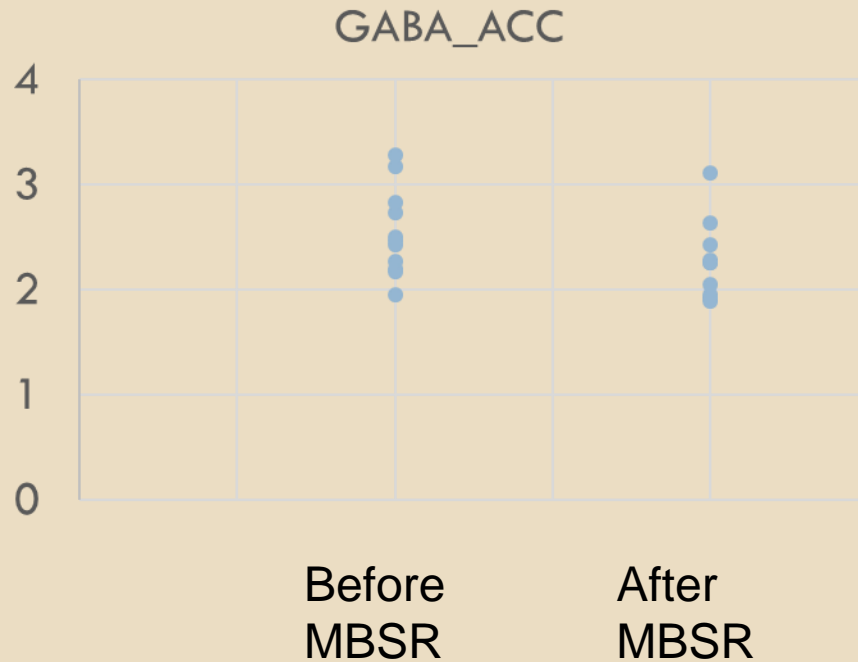
NTS: nucleus tractus solitaries



CPT scores before and after MBSR (n =17)



Effect of MBSR on GABA



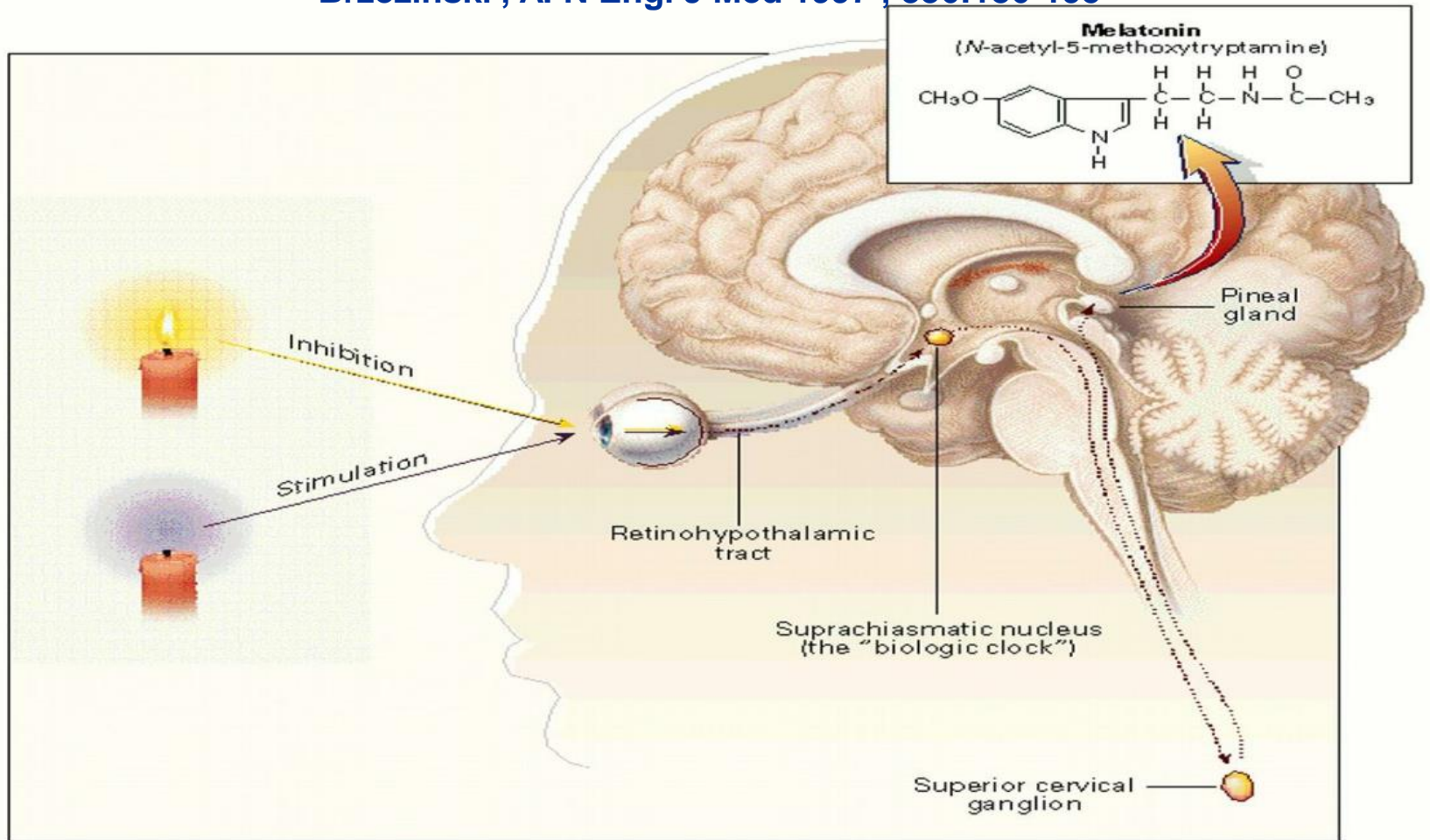
A reduced GABA concentration after MBSR was observed

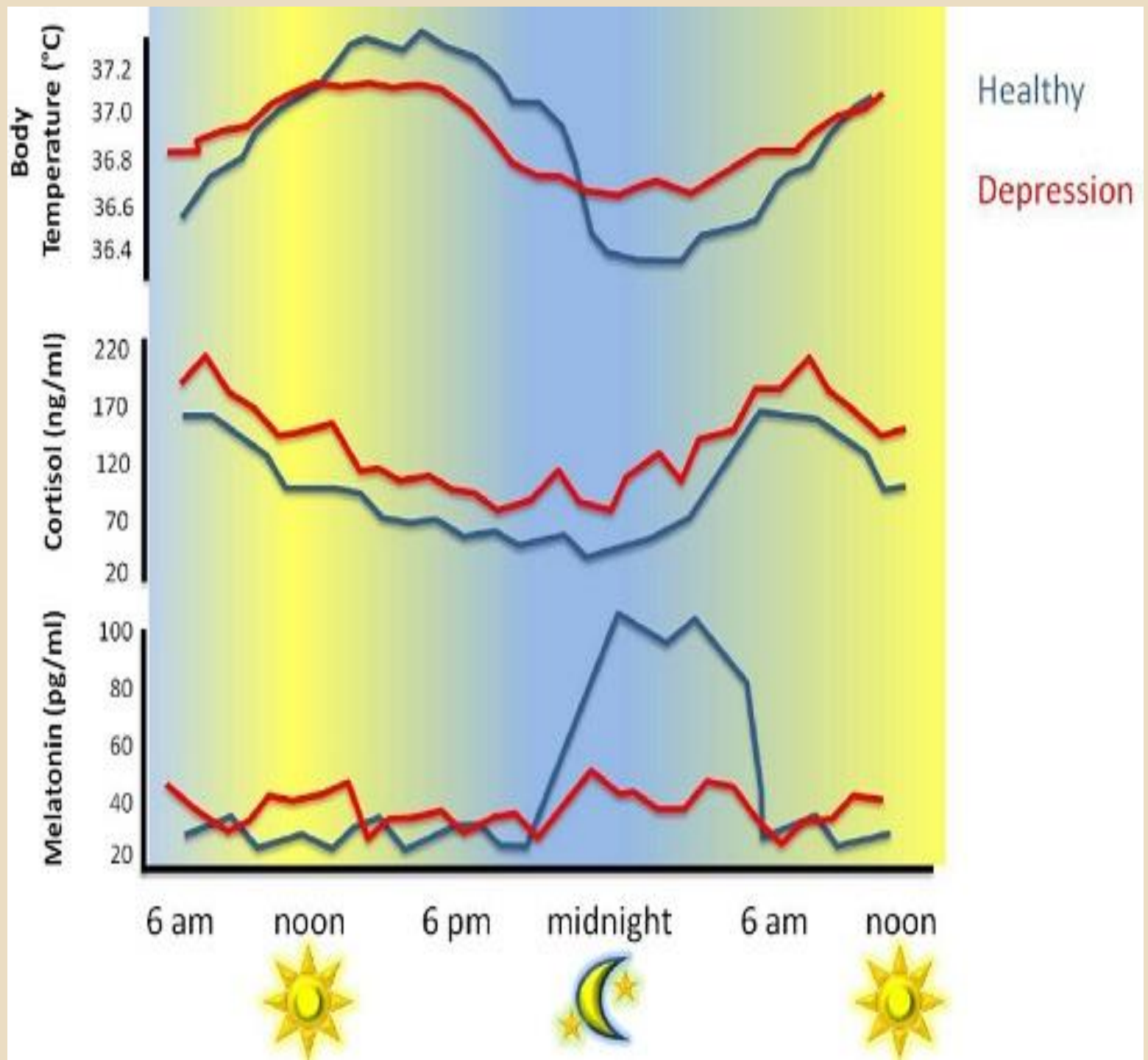
Before: 2.55 ± 0.42

After: 2.25 ± 0.38

Wilcoxon test = 2.67, P = 0.008

Brzezinski, A. N Engl J Med 1997; 336:186-195





2017年諾貝爾生醫獎得主



霍爾

Jeffrey C. Hall

羅斯巴殊

Michael Rosbash

麥可·揚

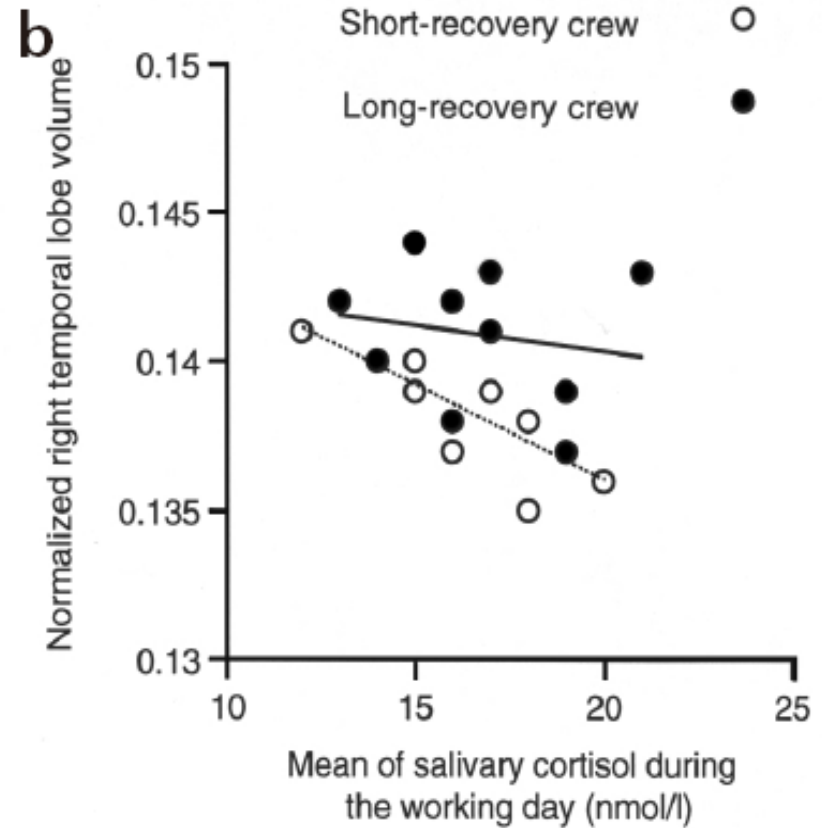
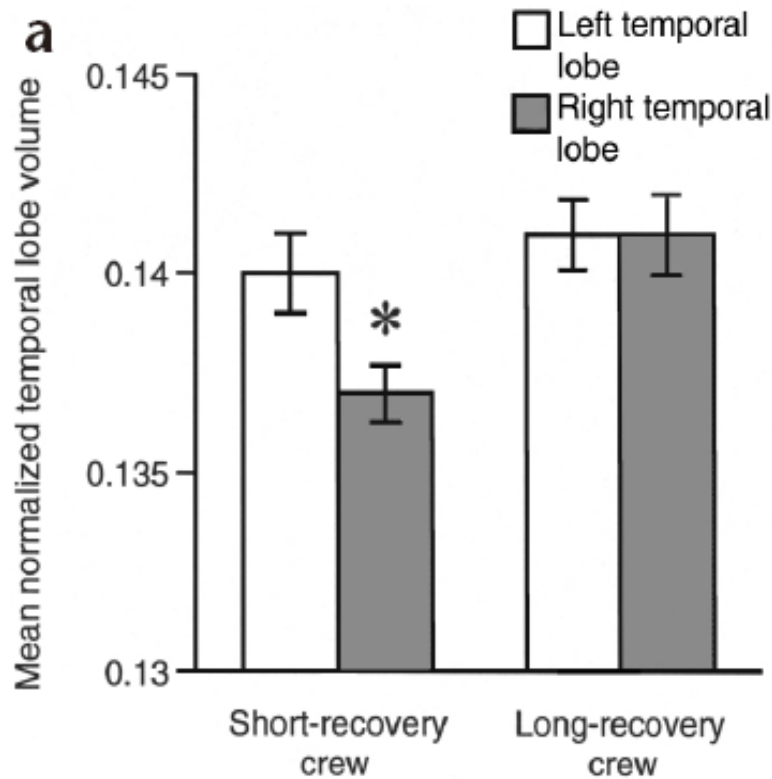
Michael W Young

得獎原因

以果蠅作為研究模型，發現可控制蛋白質週期性變化的基因，並適用於人體身上，為解構生理時鐘的基本機制打開大門。

資料來源：TechOrange (<https://reurl.cc/KrQ5Zg>)

生理時鐘常變動會減少腦容積



(Cho K et al Nature neuroscience 2001)

Table 2. Risk of dementia associated with all covariates used in our final model compared to controls.

Characteristic	Unadjusted OR, 95% CI	Adjusted OR, 95% CI
Insomnia	1.60, (1.44, 1.77)	1.34, (1.20, 1.50)
Age at index date	1.00, (1.00, 1.00)	1.00, (1.00, 1.00)
Heart failure	1.24, (1.11, 1.38)	1.14, (1.02, 1.28)
Female gender	1.00, (0.97, 1.03)	0.95, (0.90, 1.00)
Mental illness	1.58, (1.51, 1.65)	1.79, (1.70, 1.89)
Stroke	1.49, (1.38, 1.62)	1.47, (1.35, 1.61)
Chronic pulmonary disease	1.39, (1.32, 1.47)	1.42, (1.33, 1.51)
Hypnotics (100 PDDs)	1.02, (1.01, 1.03)	1.01, (1.00, 1.02)
Sleep apnoea	1.35, (0.72, 2.53)	0.95, (0.50, 1.81)

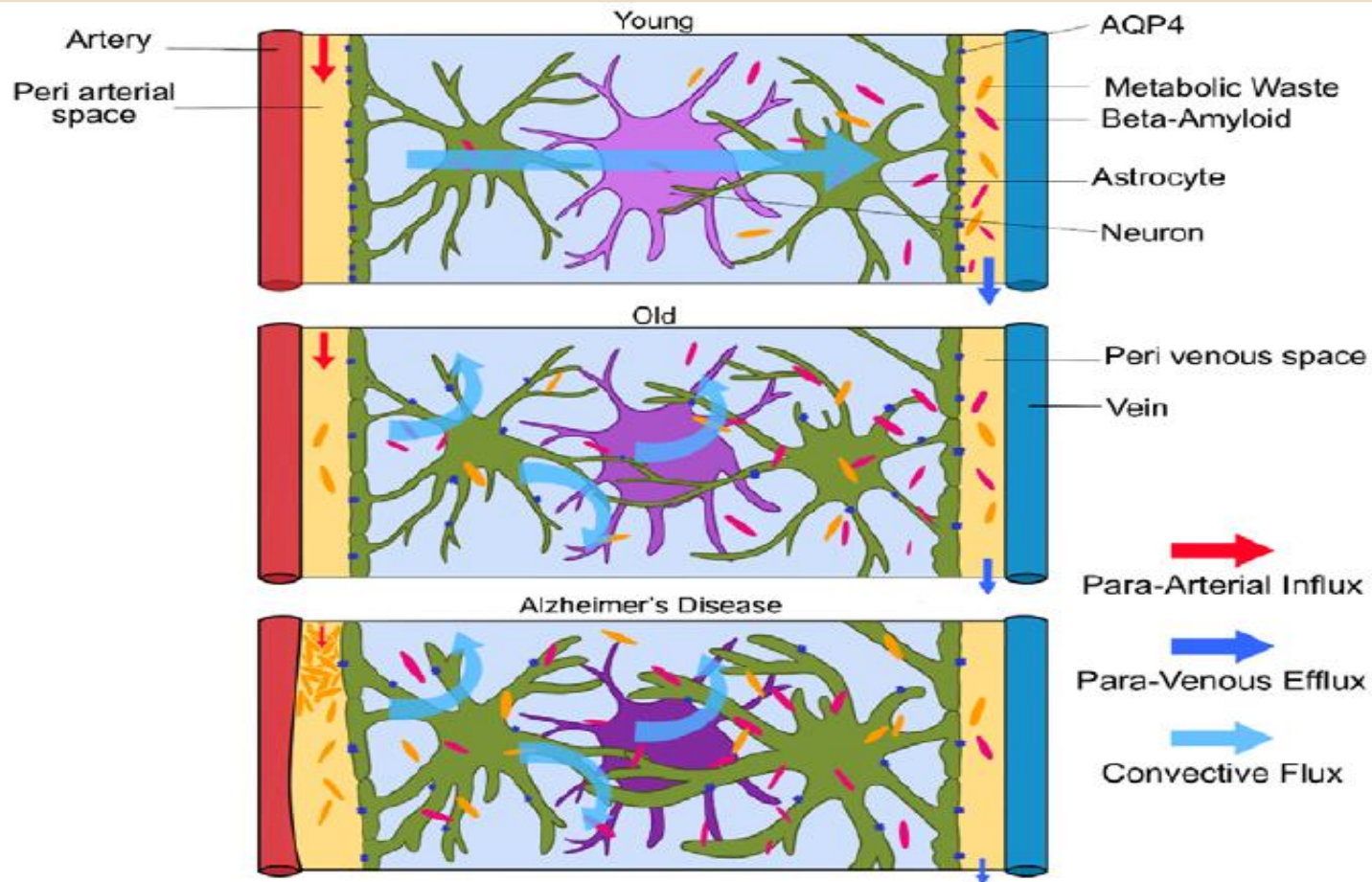


Figure 4. (Figure illustrated by Jessamyn Camille Reddy, adapted from; [1] p. 26, permission obtained) Model of glymphatic function in Young, Old and Alzheimer's disease. In young people, CSF travels along periarterial routes, entering the brain parenchyma, and washes solutes and waste products into the veins. In older people, the loss of AQP4 water channels will result in reduced glymphatic clearance. In those with Alzheimer's disease, the accumulation of amyloid-beta impairs fluid movement within the interstitial space, decreasing glymphatic clearance.

Reddy et al Brain Sci 2020 Nov 17;10(11):868

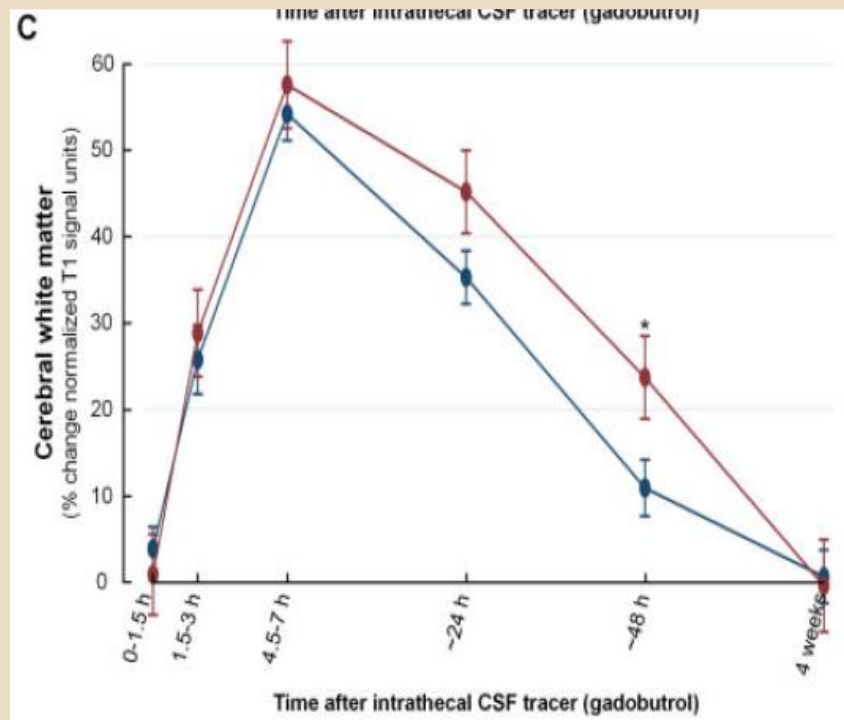
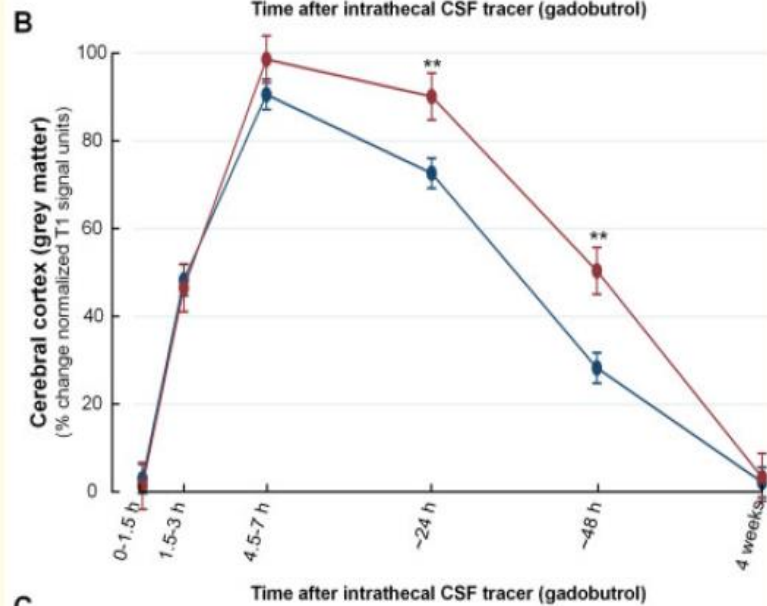
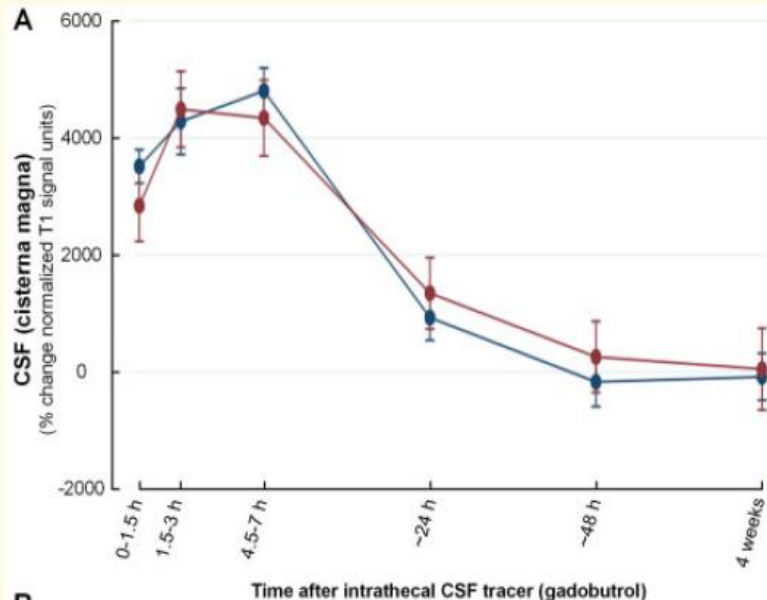
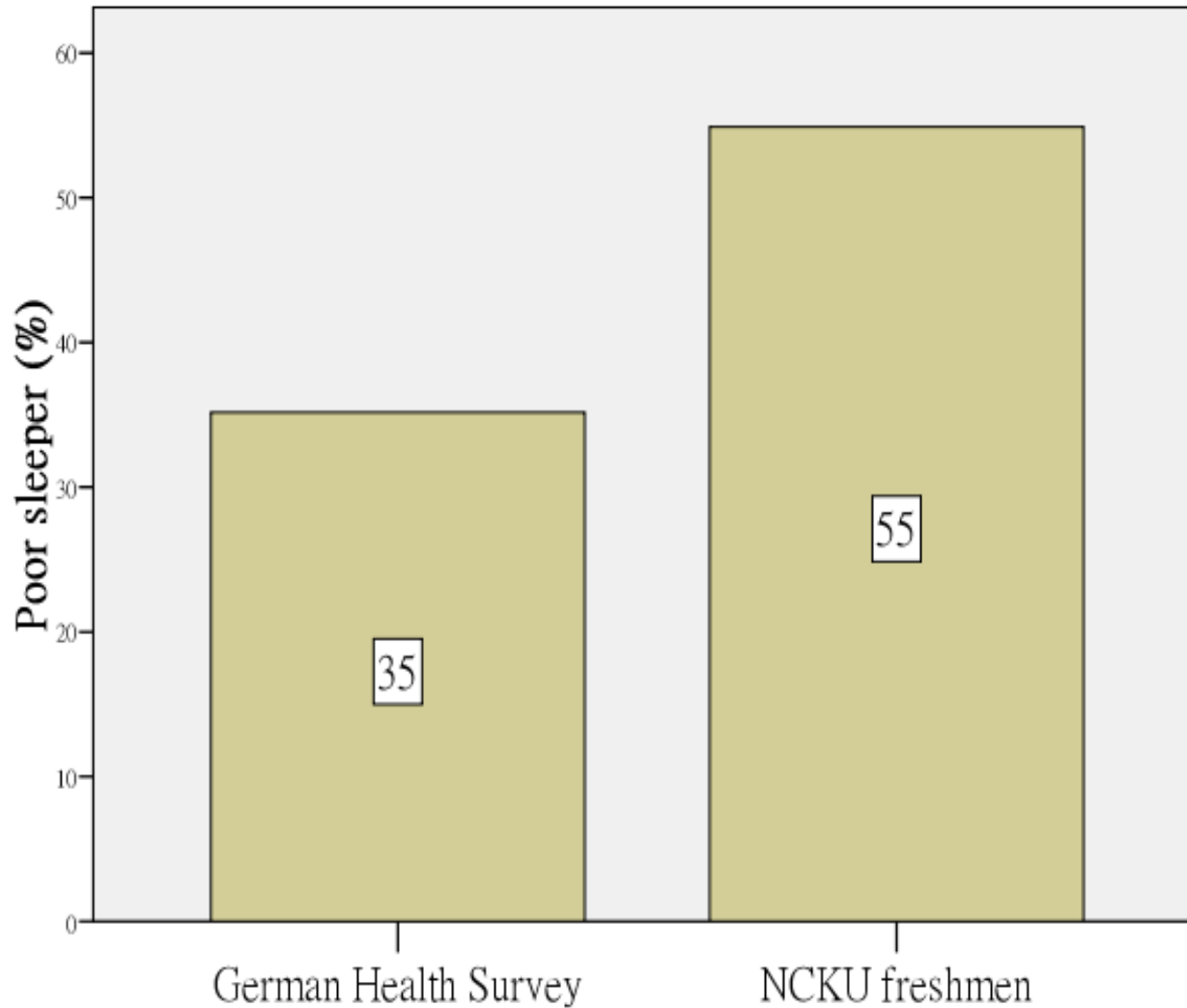


Figure 4 One night of total sleep deprivation reduces clearance of tracer from the brain that lasts even after another night of sleep. Trend plots of percentage change in signal unit ratio, indicative of tracer enrichment within brain tissue, are presented for different regions, including (A) CSF space at the craniocervical junction, (B) cerebral cortex (grey matter), and (C) cerebral white matter. While tracer levels were similar between the groups in the CSF space (A), there were significant differences between the sleep deprivation (red) and sleep (blue) groups in grey matter of the cerebral cortex (B) and white matter (C) at 24 h (i.e. after sleep intervention) and at 48 h (both groups were allowed to sleep freely from 24 to 48 h). * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$. Trend plots are presented with mean \pm SE from linear mixed models.

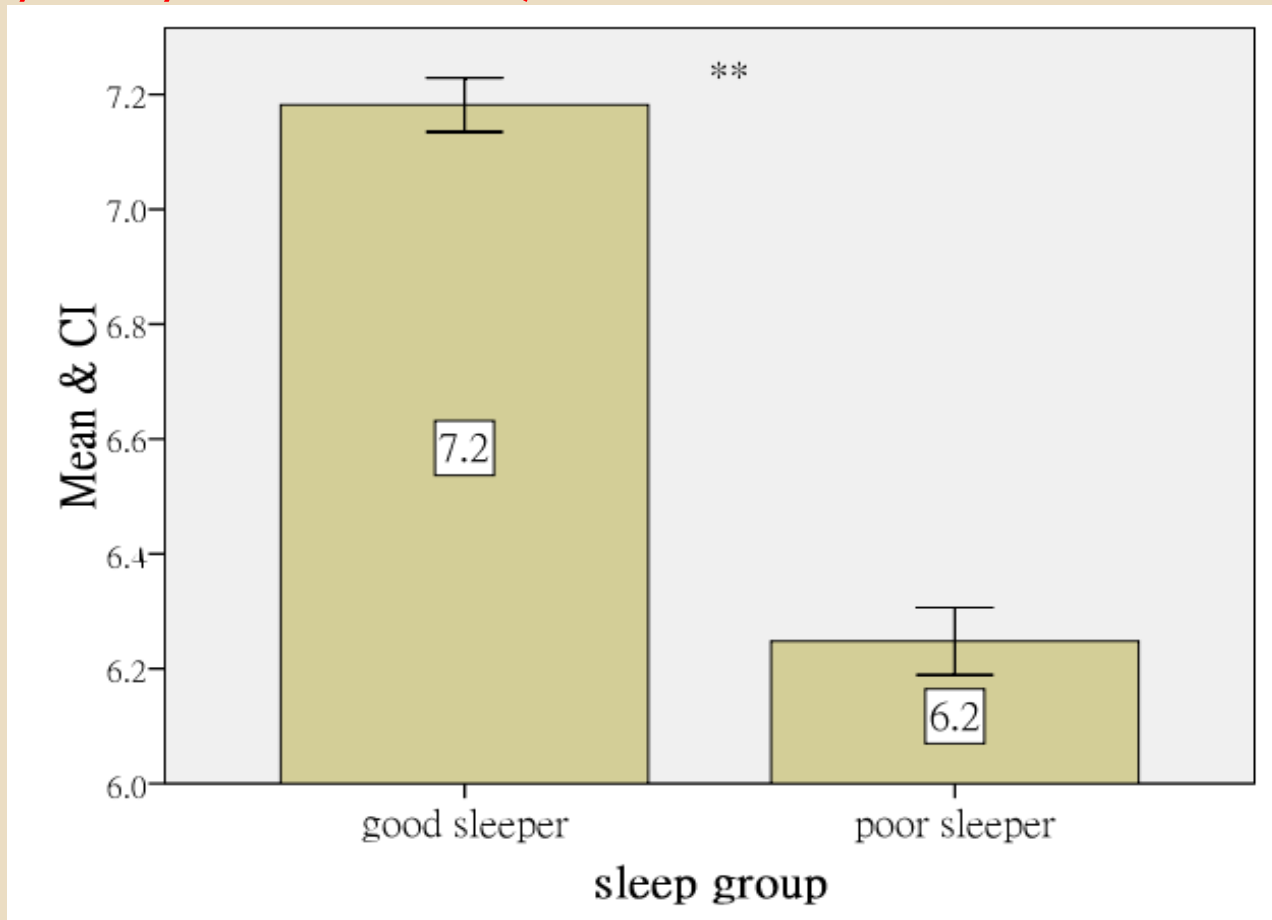
德國 VS 成大新生

(Cheng SH et al Psychiatry Research 2012)



睡眠時間之比較

(Cheng SH et al Psychiatry Research 2012)



	good sleeper	poor sleeper	Statistic	
	Mean (SD)	Mean (SD)	t	p
每晚實際睡眠時間	7.18 (1.06)	6.25 (1.46)	24.35	0.00

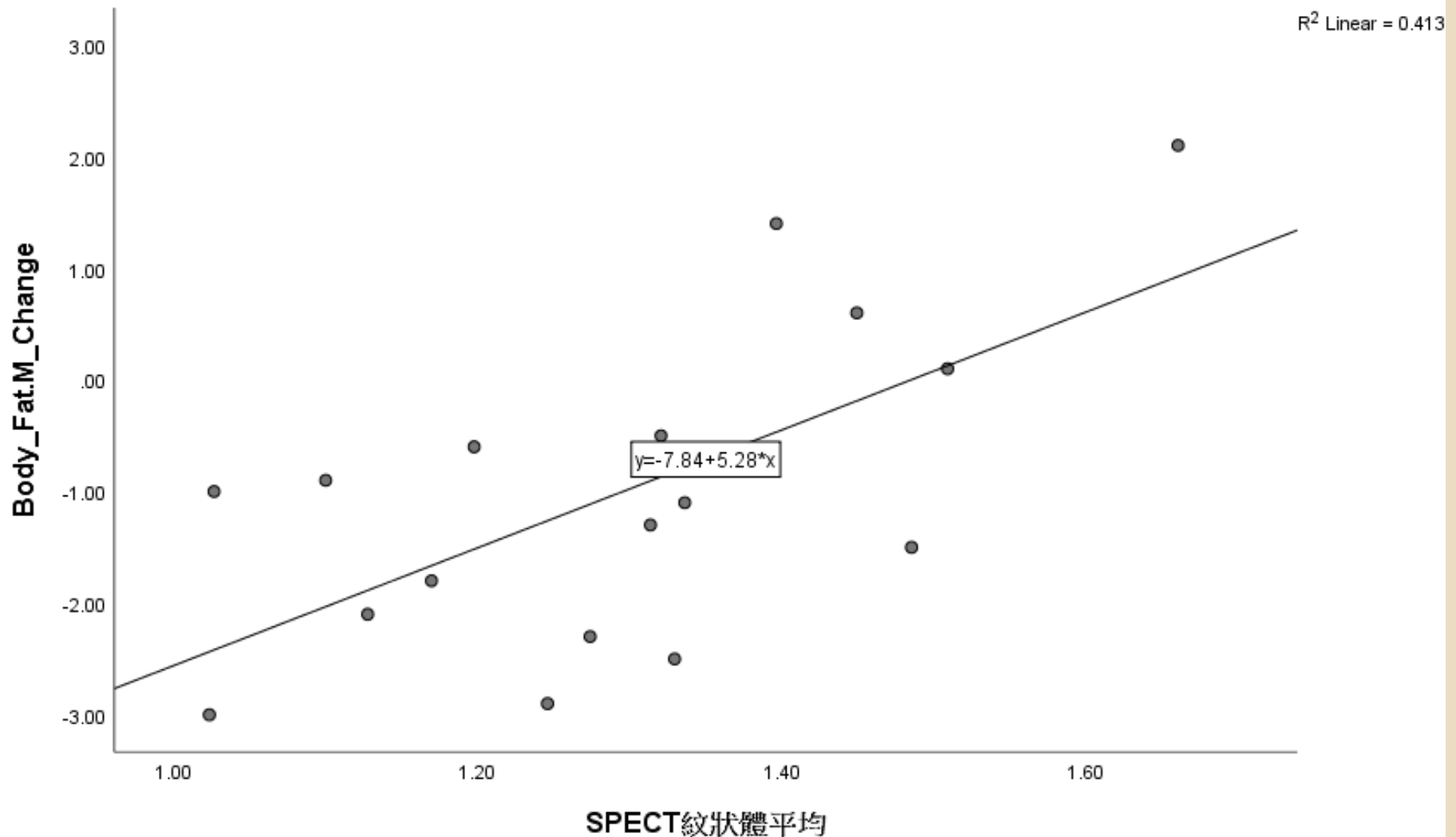
黑鮪魚與TORO

黑鮪魚剖面說明



DAT availability of the striatum associated with body fat mass change at baseline

(non-parametric, $r=.549$, $p=0.022$) (Abdullha M et al unpublished)

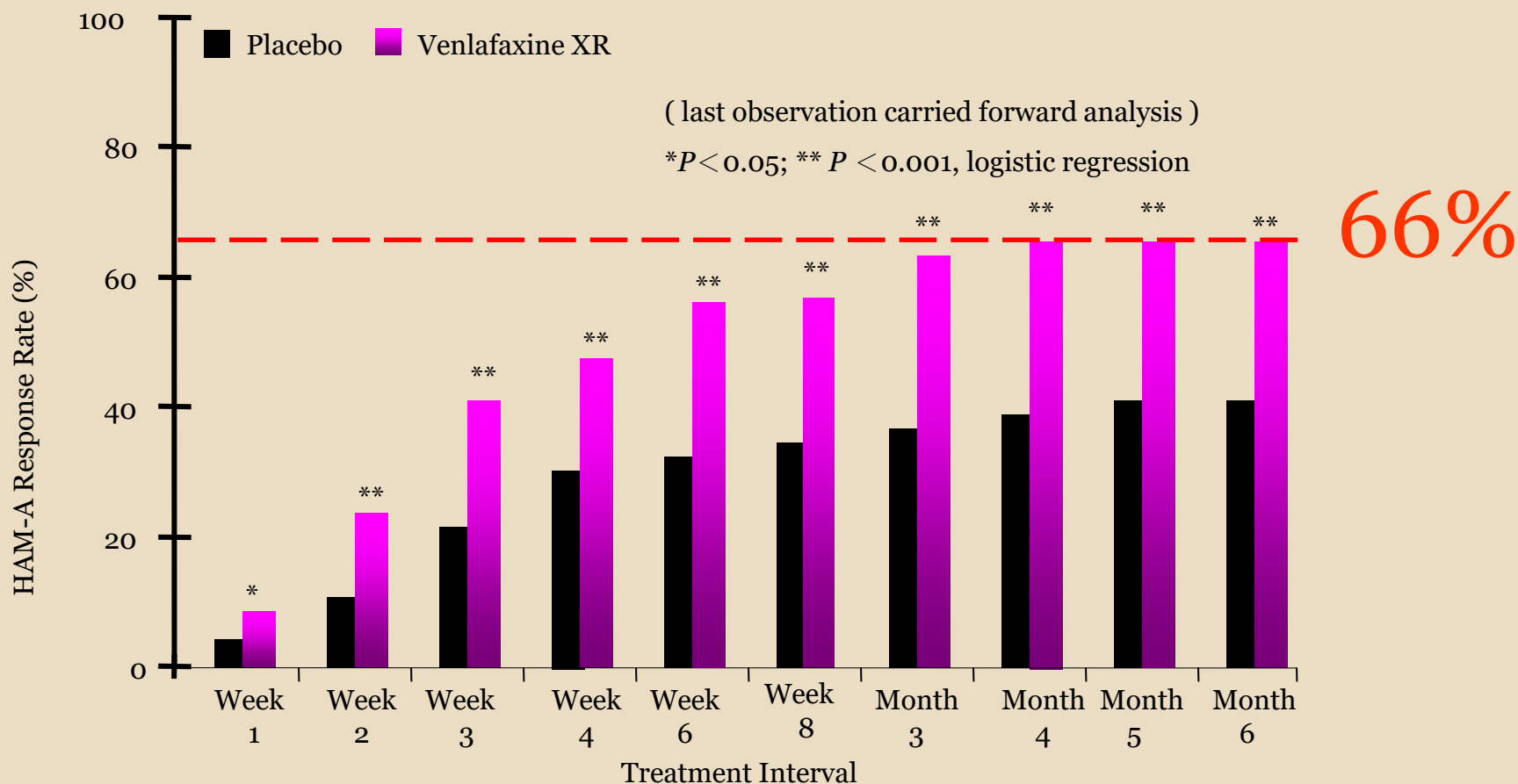


大 網

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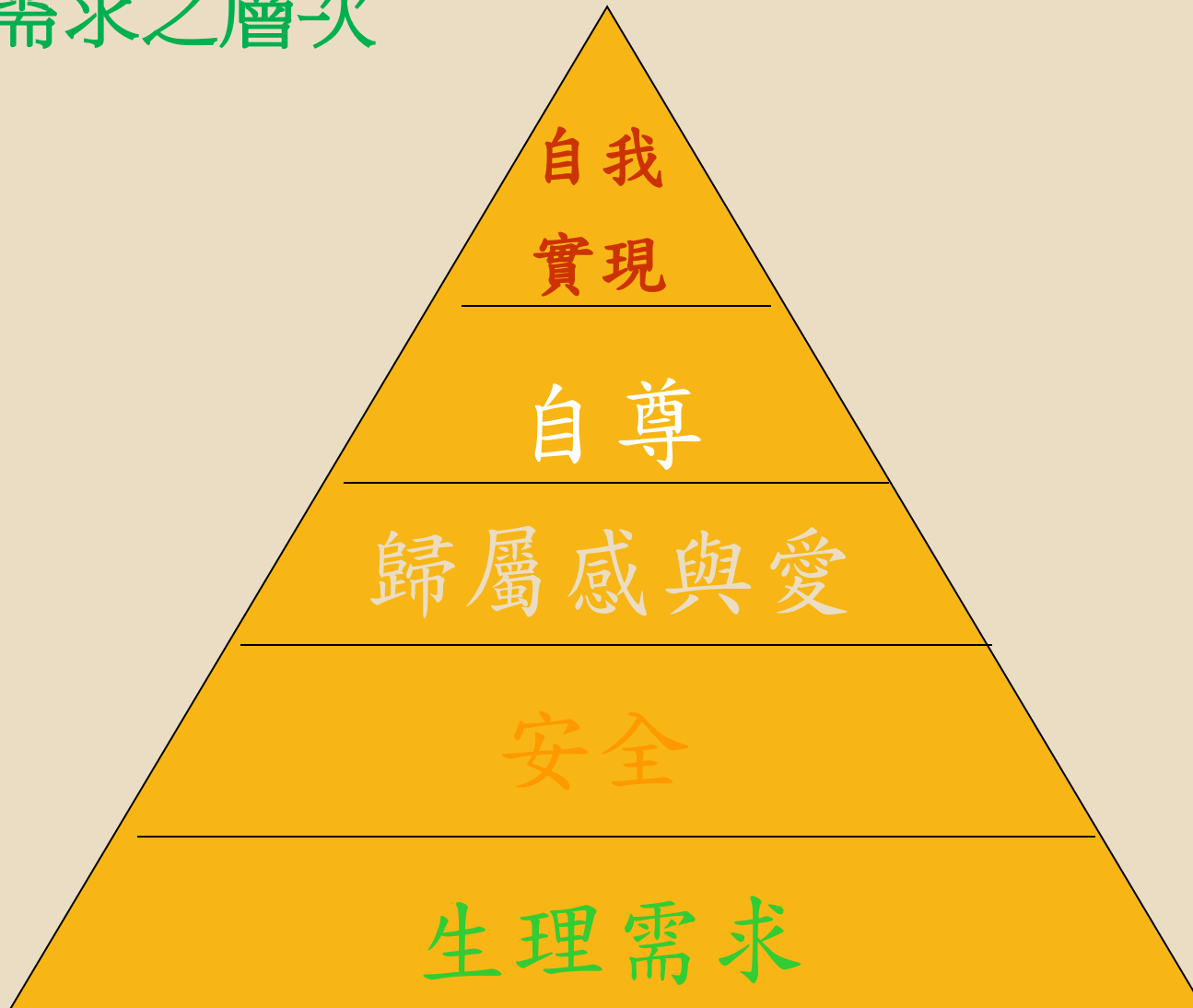
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- 優化腦力：睡眠 / 正念 / 運動之影響
- 淺見參考

Time Course of 療效反應率 with Venlafaxine XR and Placebo in the Treatment of GAD



Maslow's Hierarchy of Needs

人性需求之層次



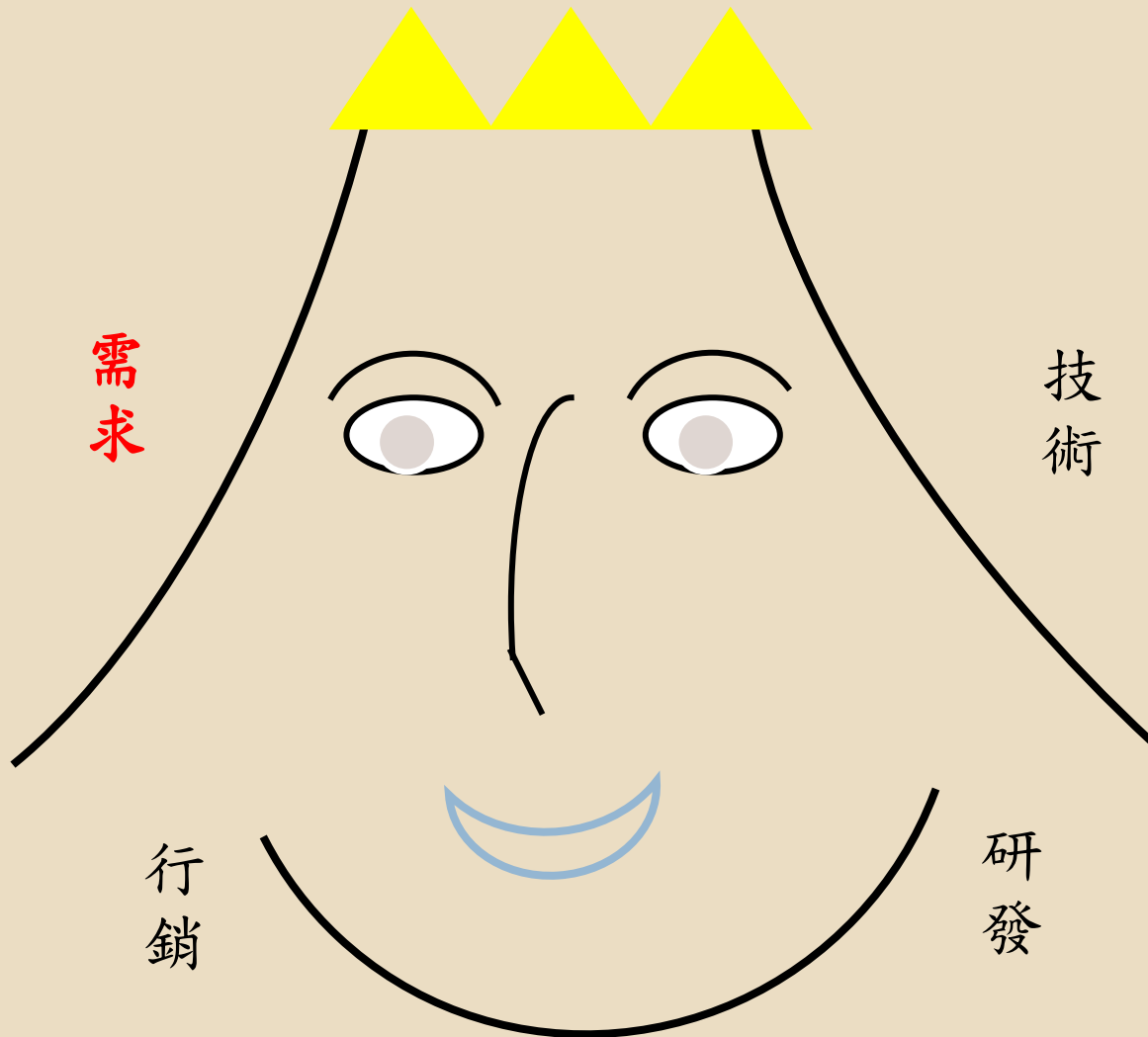
個人看法--親子互動

1. 父母親對自己目前狀態滿意嗎?(自我實現?)
2. 父母親對自己未來的焦慮是甚麼?
3. 父母親完全了解自己的孩子的特質及潛力嗎?
4. 未來20年世界會發生甚麼變化嗎?
5. 你若知道生命即將結束, 希望孩子與你們的關係是如何?

Thank you for your attention!



The bird of **Black-faced spoonbill** (*Platalea minor* Temminck et Schlegel) is an endangered species. Currently, only less 1,000 are alive in the world. You can watch them in Tainan in winter season.



知識經濟

桂冠爭奪



(Yang 2005)