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# Sucht – wenn aus dem Elixier des Lebens ein Fluch wird

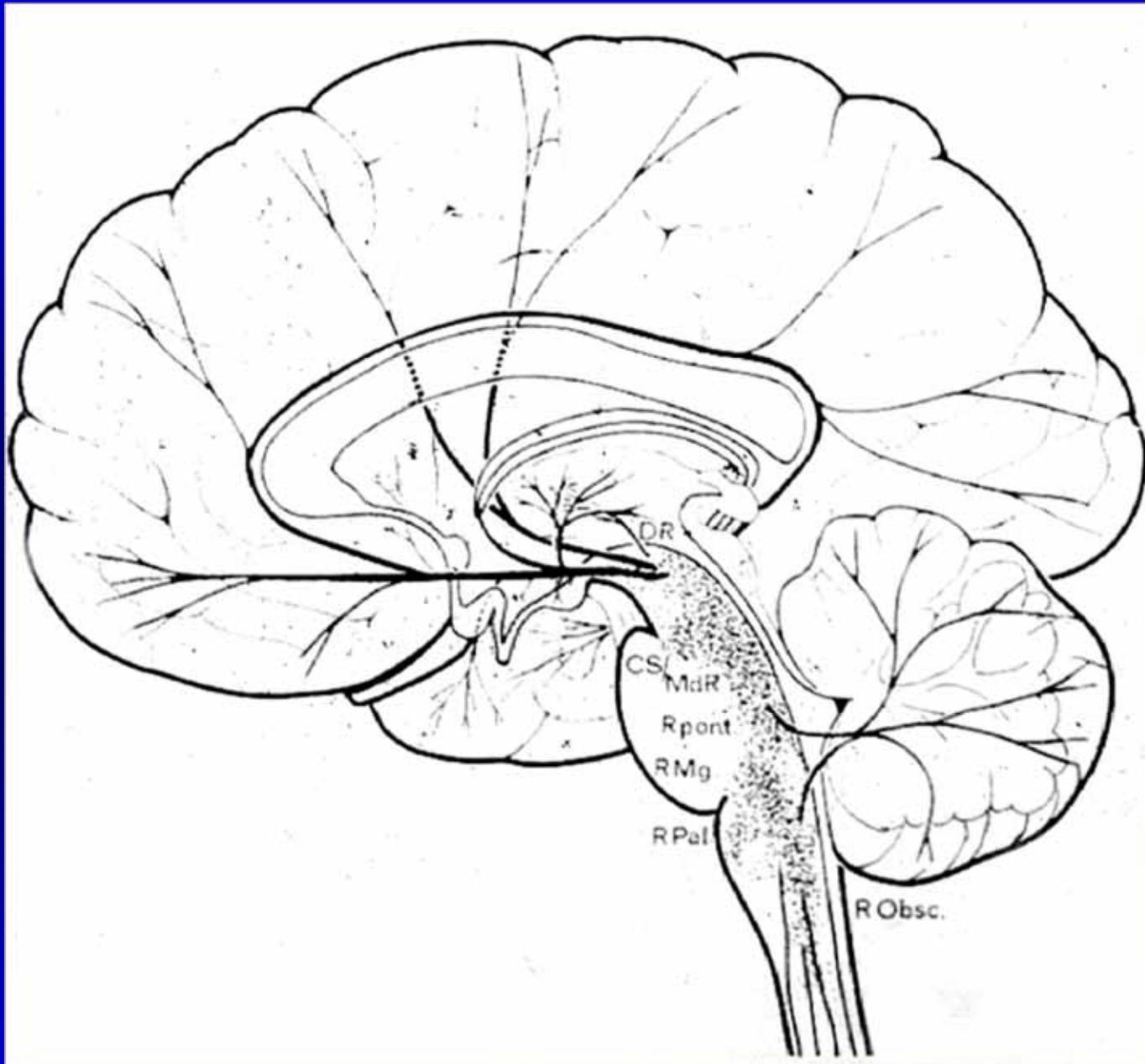
**Andreas Heinz**

**Department of Psychiatry and Psychotherapy**

**Charité - University Medicine Berlin**

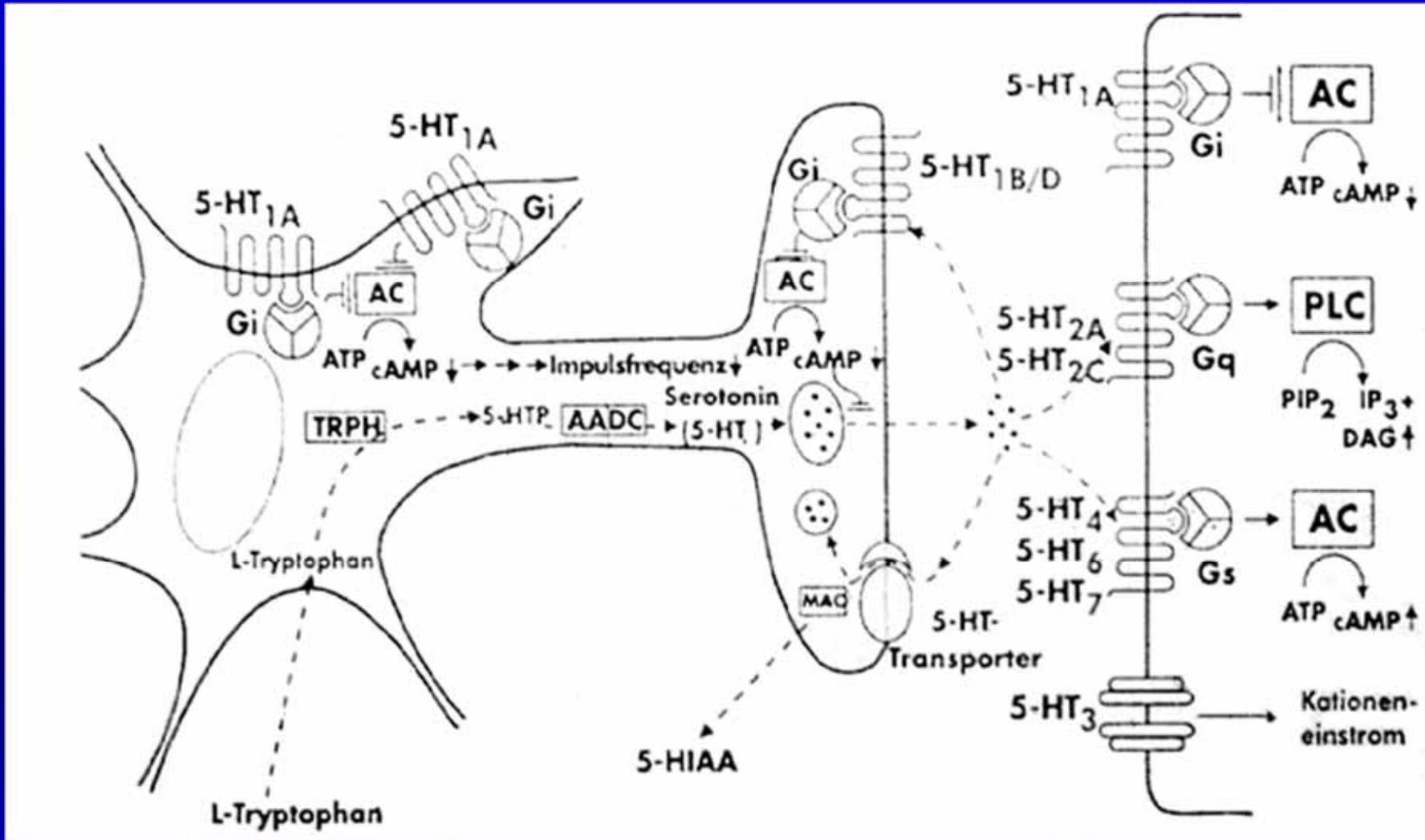
**Charité Campus Mitte & St. Hedwig Hospital**

# Disposition



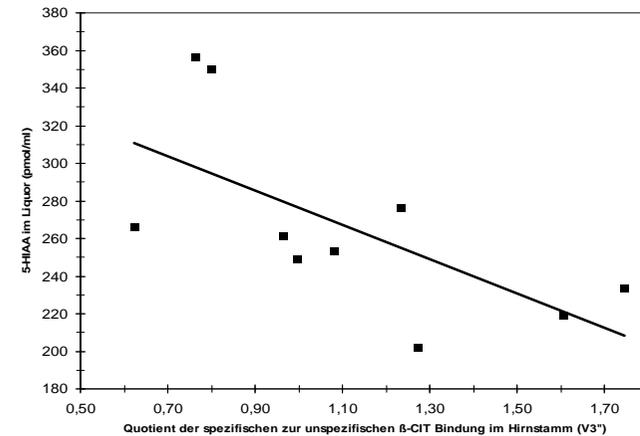
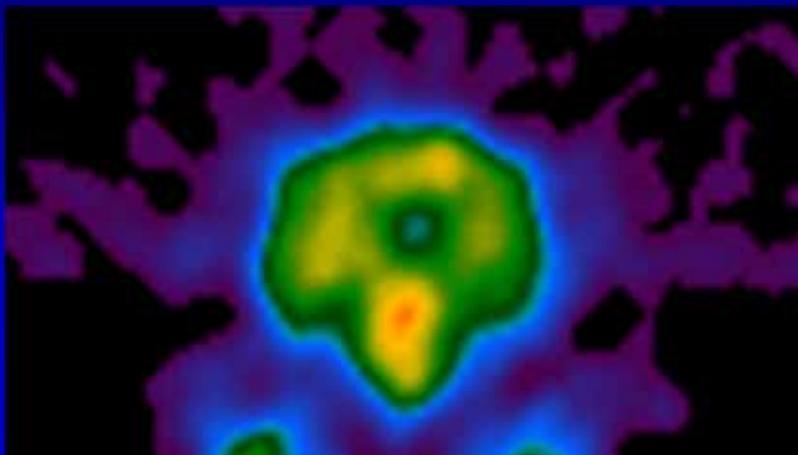
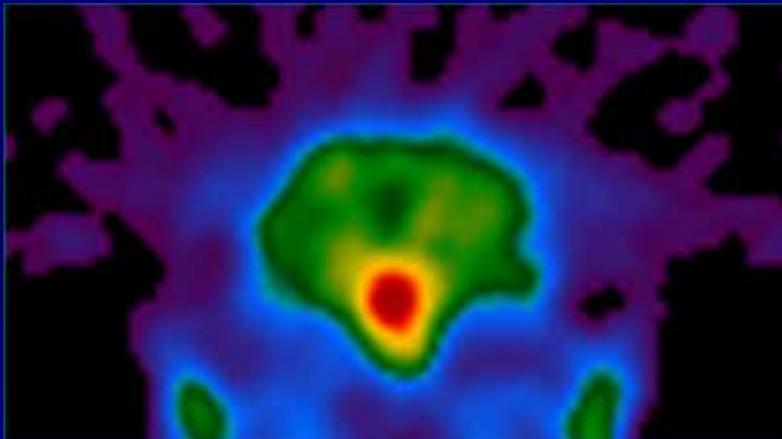
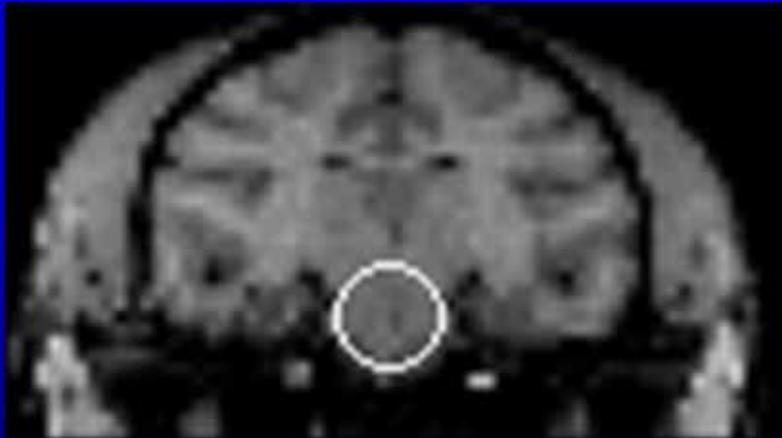
Zentrales serotonerges System. Baumgarten 1987

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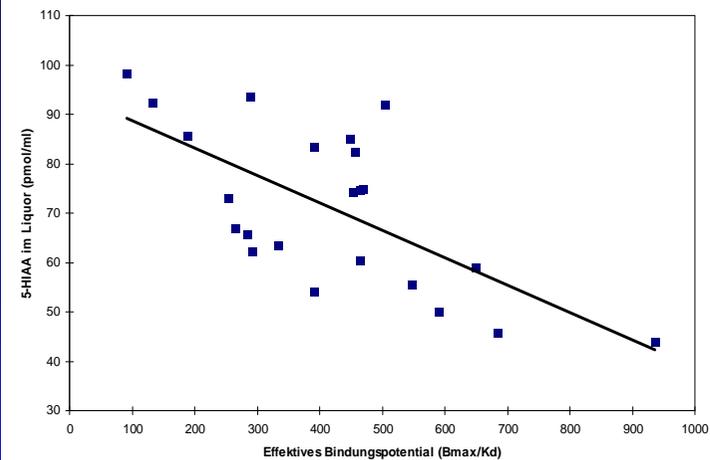


## Serotonerges Neuron und Synapse

*Benkert 1996*



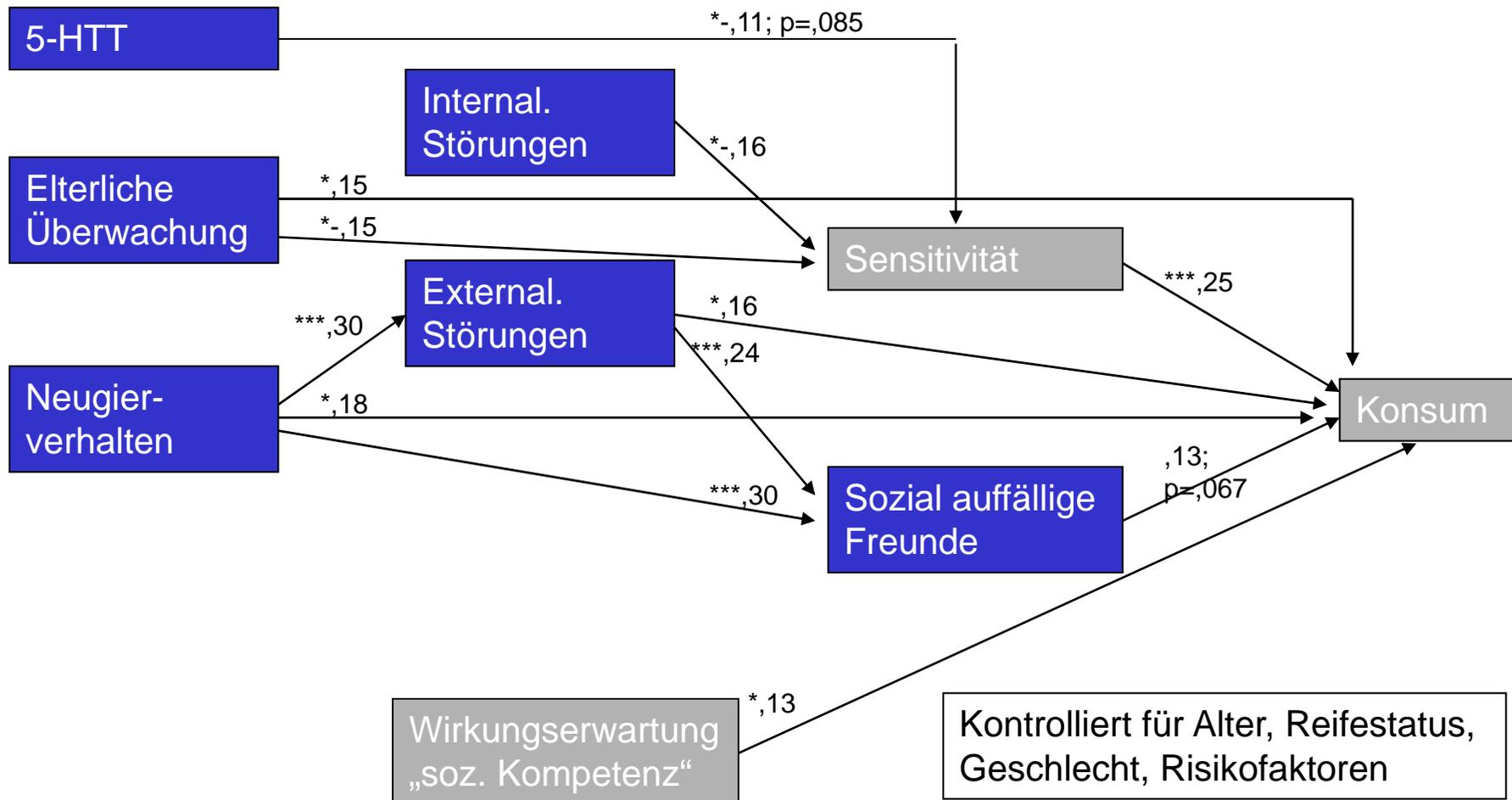
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Heinz et al., Am. J. Psychiatr. 1998,  
& Pharmacopsychiatr. 2002

# Integratives, prädiktives Modell

Multiple lineare hierarchische Regressionsanalyse:  
 Multiple  $r = ,521$ ; **adjusted  $r^2 = ,231$** ;  $F(12, 225) = 6,620$ ;  $p < ,001$



# **Aufrechterhaltung der Abhängigkeit**

# Schädlicher Konsum

z.B. Depression

# Hirnatrophie bei Alkoholabhängigkeit



# Toleranzentwicklung

# GABAerge Neurotransmission in der frühen Abstinenz

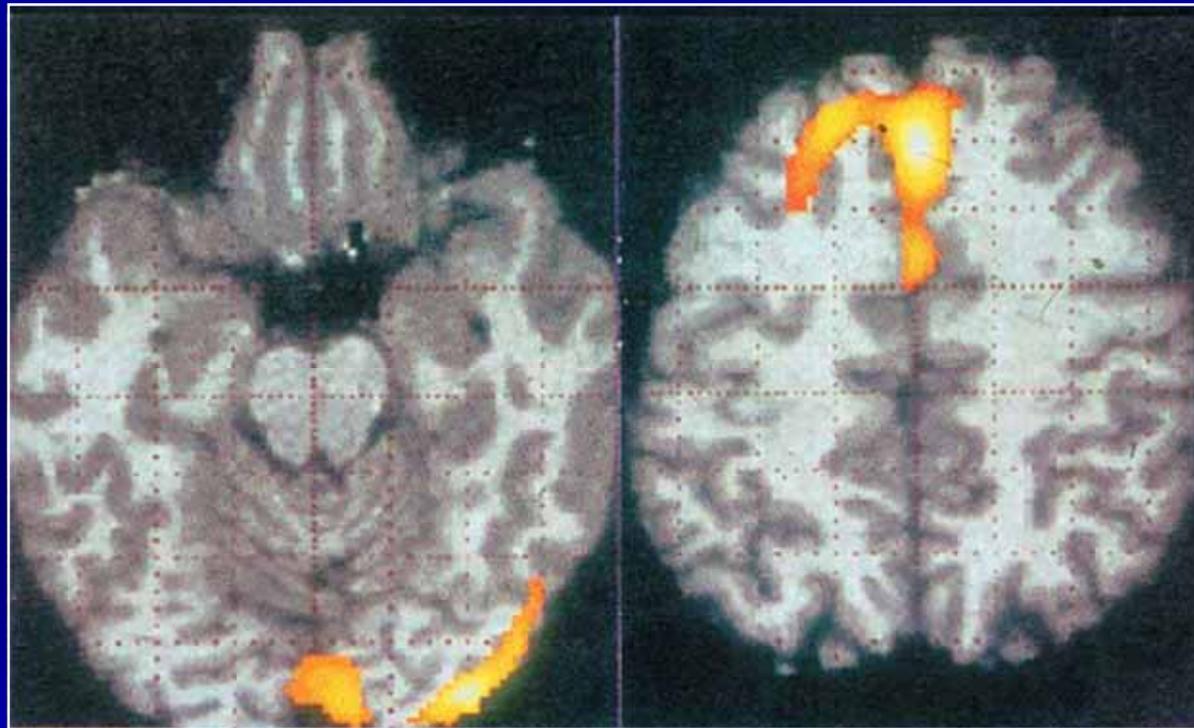
Chronischer Alkoholkonsum



Frühe Abstinenz

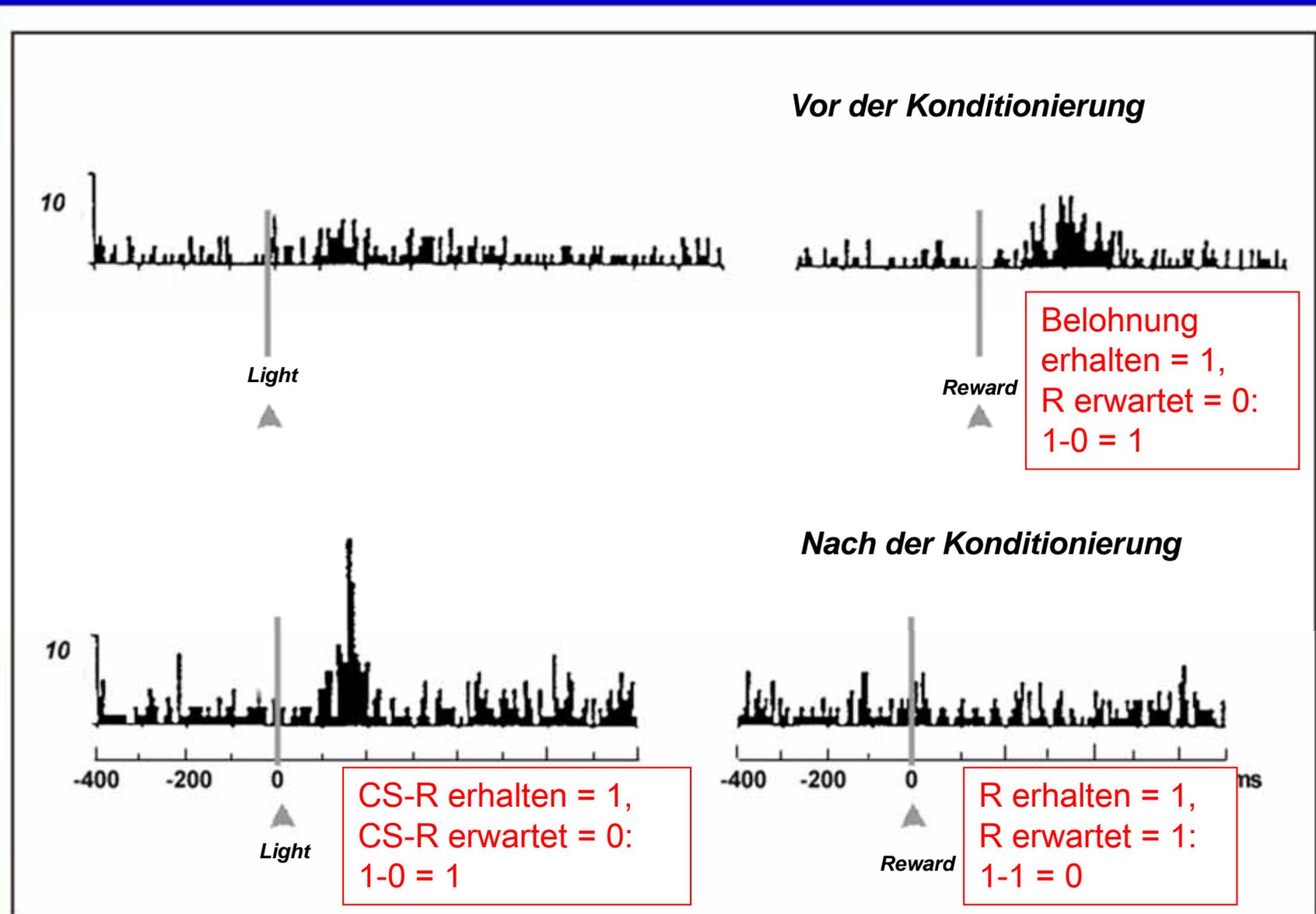


# Reduzierte GABA-A Rezeptoren in der frühen Abstinenz



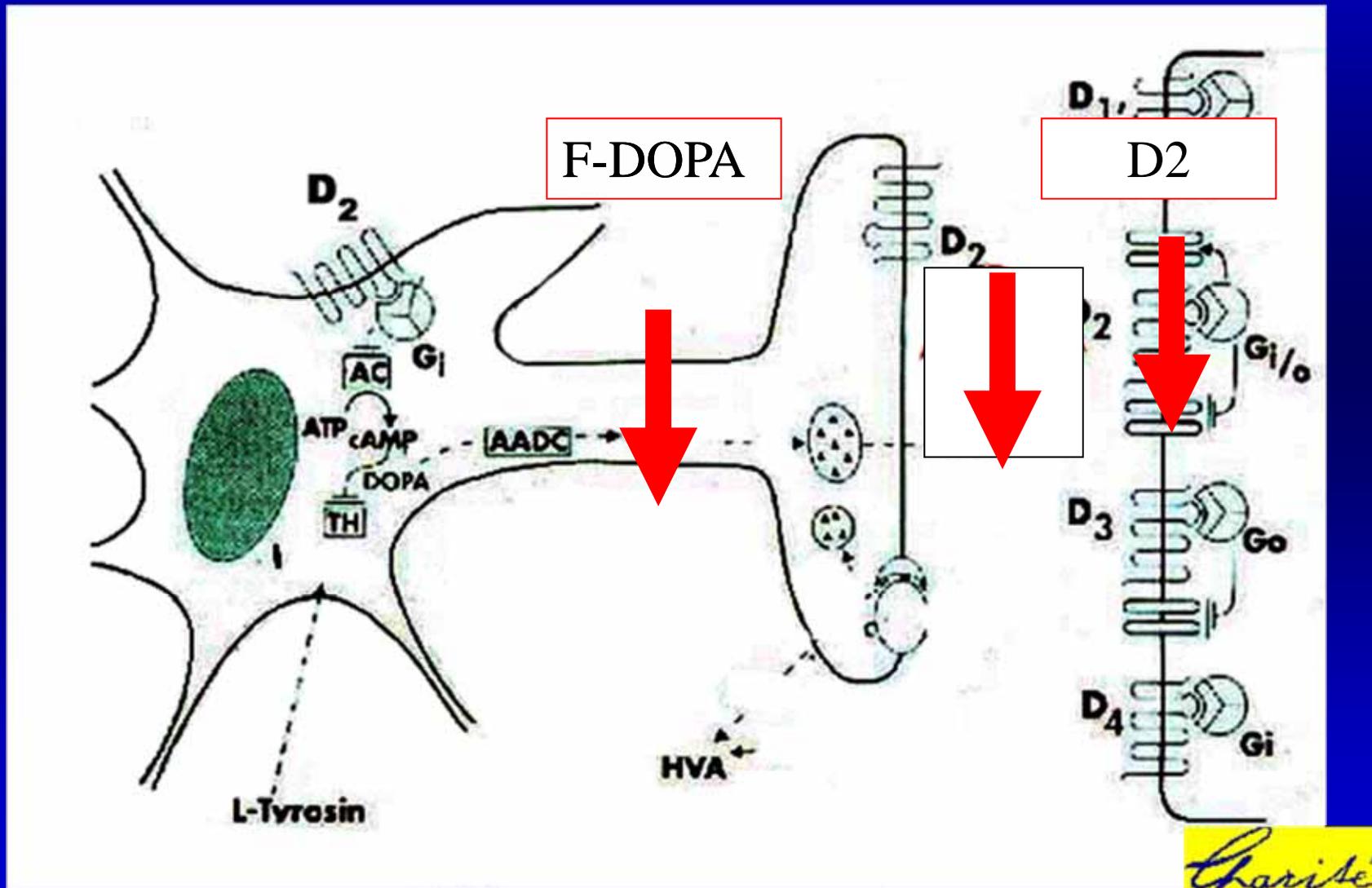
Abi-Dargham et al., *Am J Psychiatry*, 1998

**Craving & reduzierte Kontrolle**

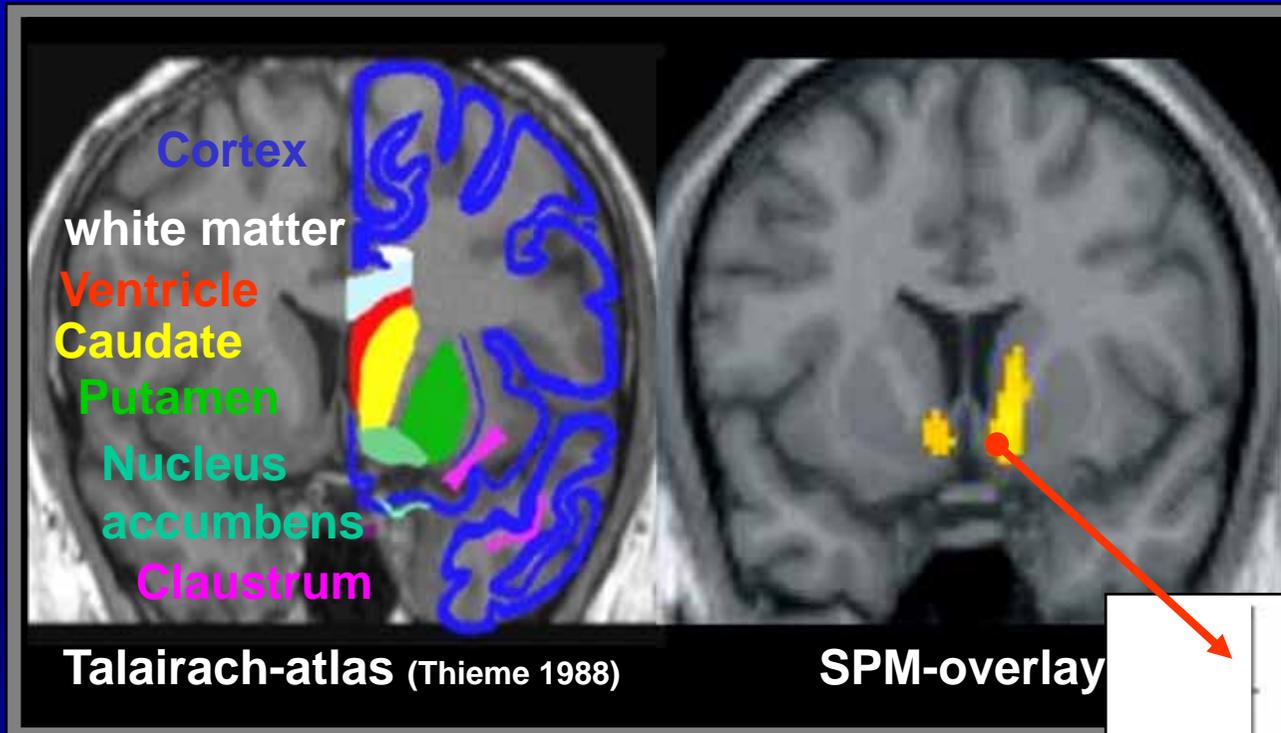


Schultz et al., 1993

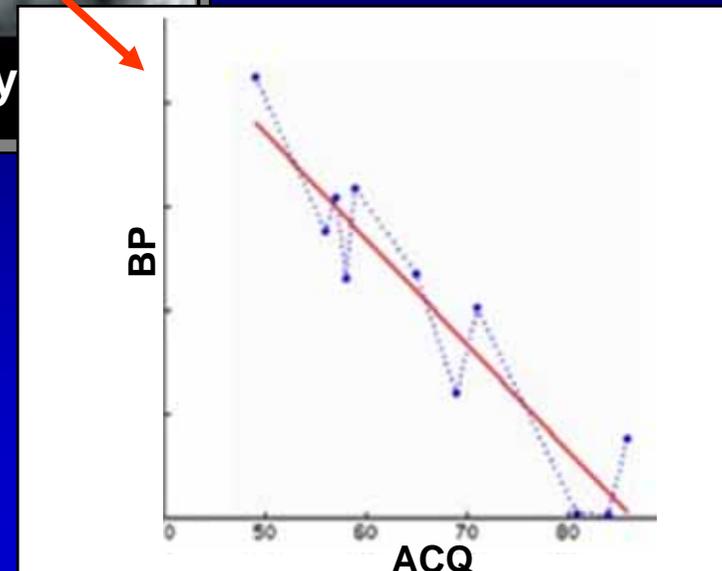
# Alkoholentzug & frühe Abstinenz



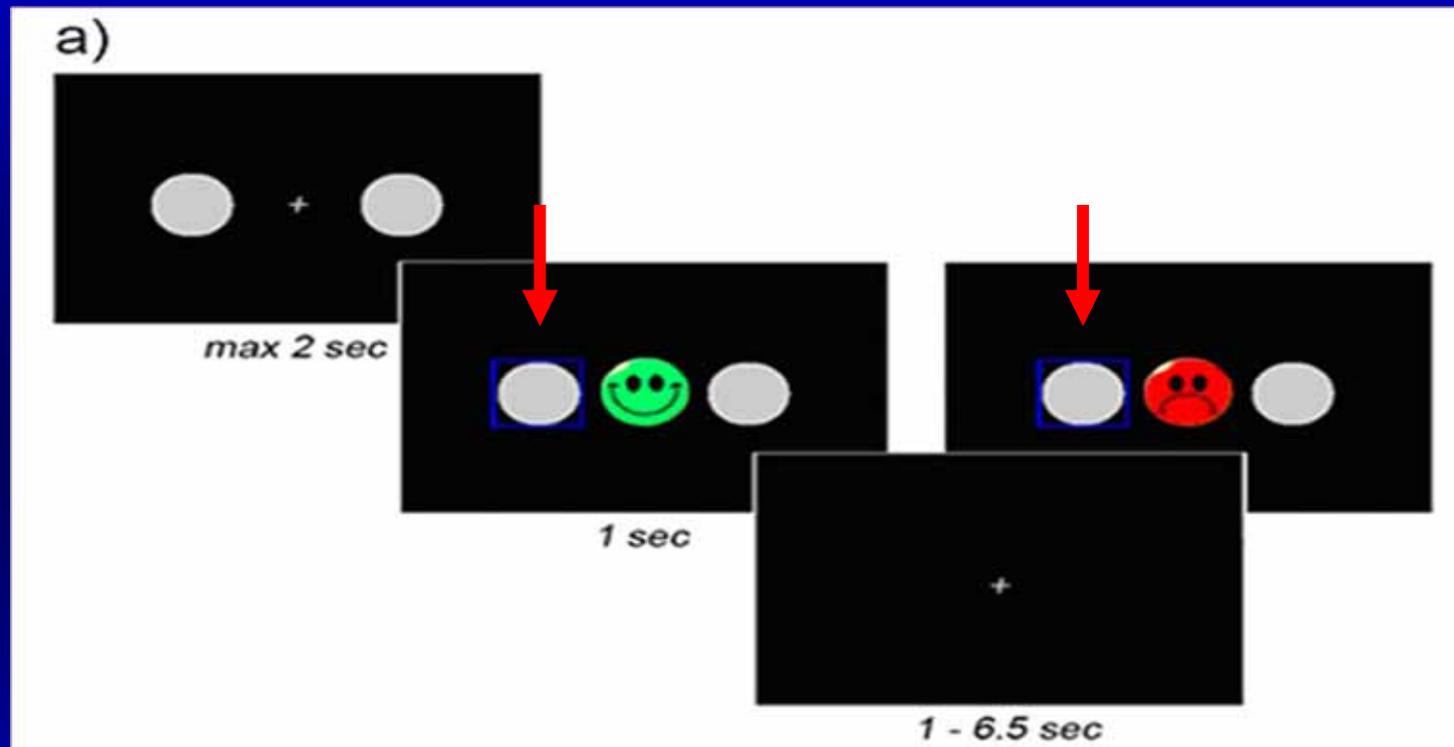
# Reduzierte Dopamine D2 Rezeptorverfügbarkeit & Craving



Heinz et al., AJP 2004

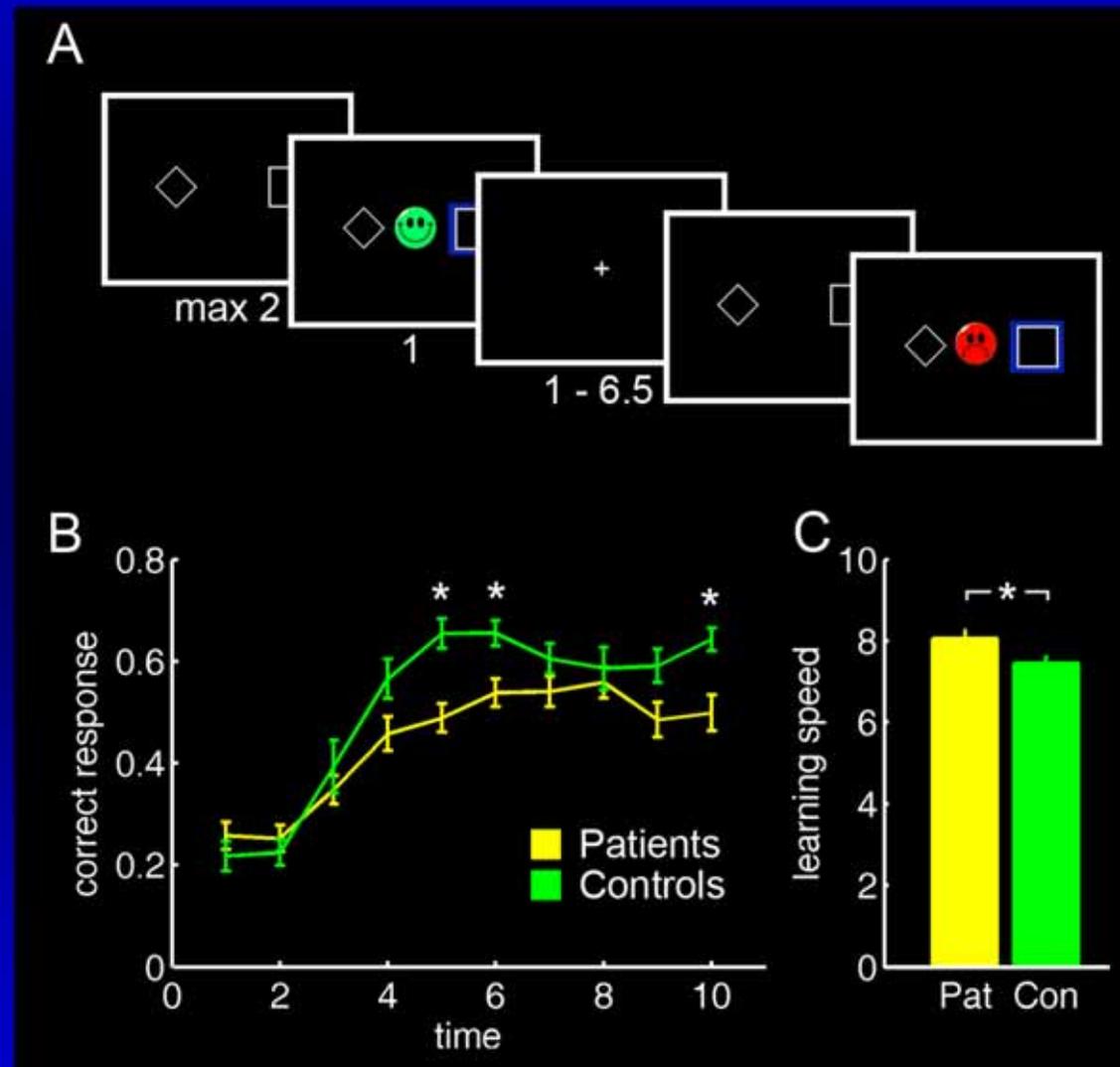


# Reversal learning Paradigm

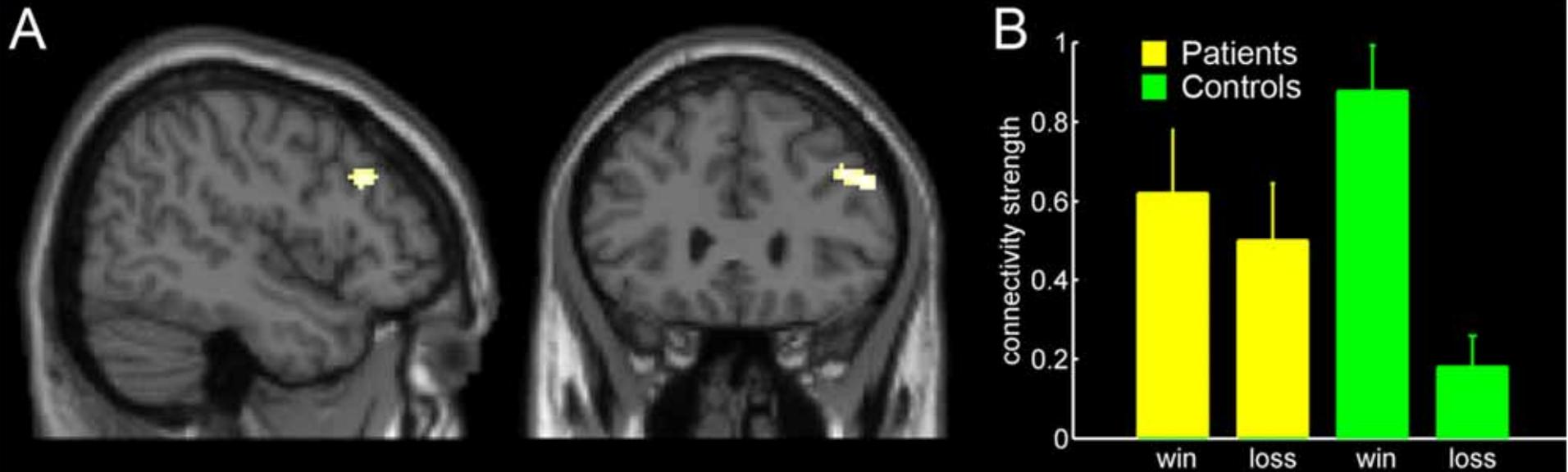


2 runs \* 100 trials  
6 – 10 conditions per run

# Reduzierte Lernleistung bei alkoholabhängigen Patienten



# Reduzierte Lernleistung korreliert mit gestörter Vernetzung ventrales Striatum – frontaler Kortex



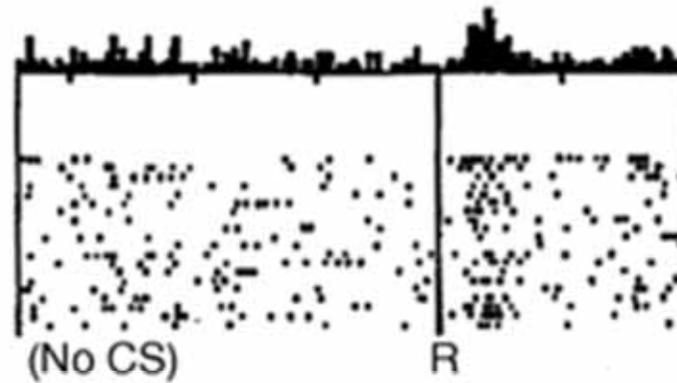
Lernrate & Stärke der Konnektivität VS - dlPFC:

$R^2 = 0.15$ ,  $p < 0.05$  FDR corrected

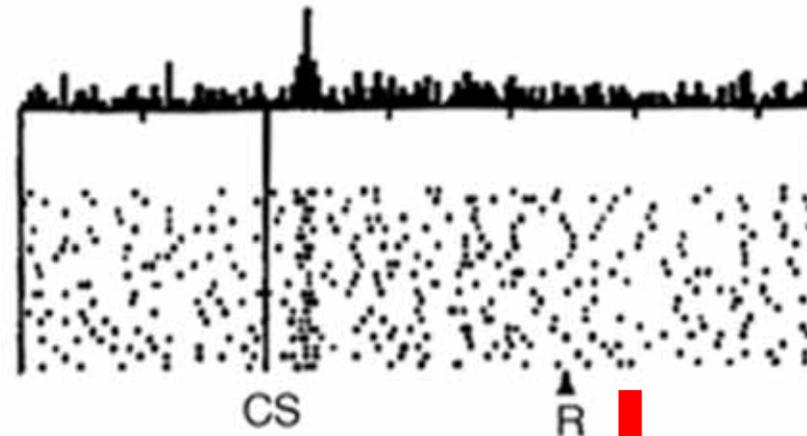
Park et al., J Neurosci 2010

# Do dopamine neurons report an error in the prediction of reward?

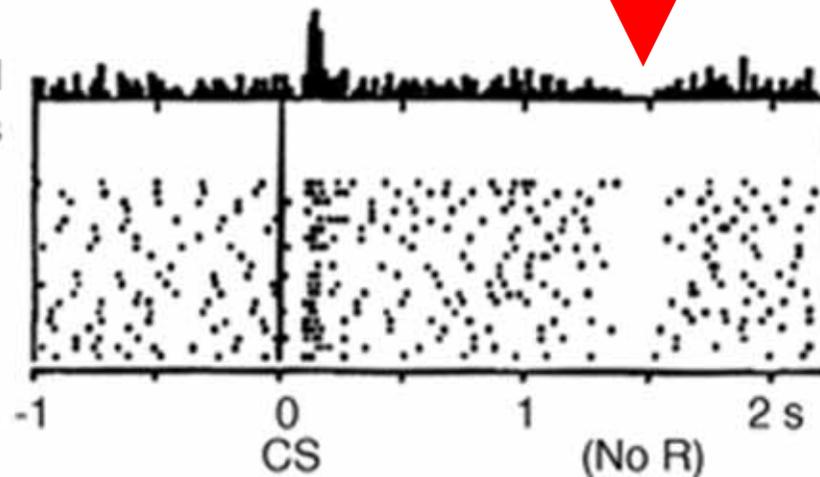
No prediction  
Reward occurs



Reward predicted  
Reward occurs



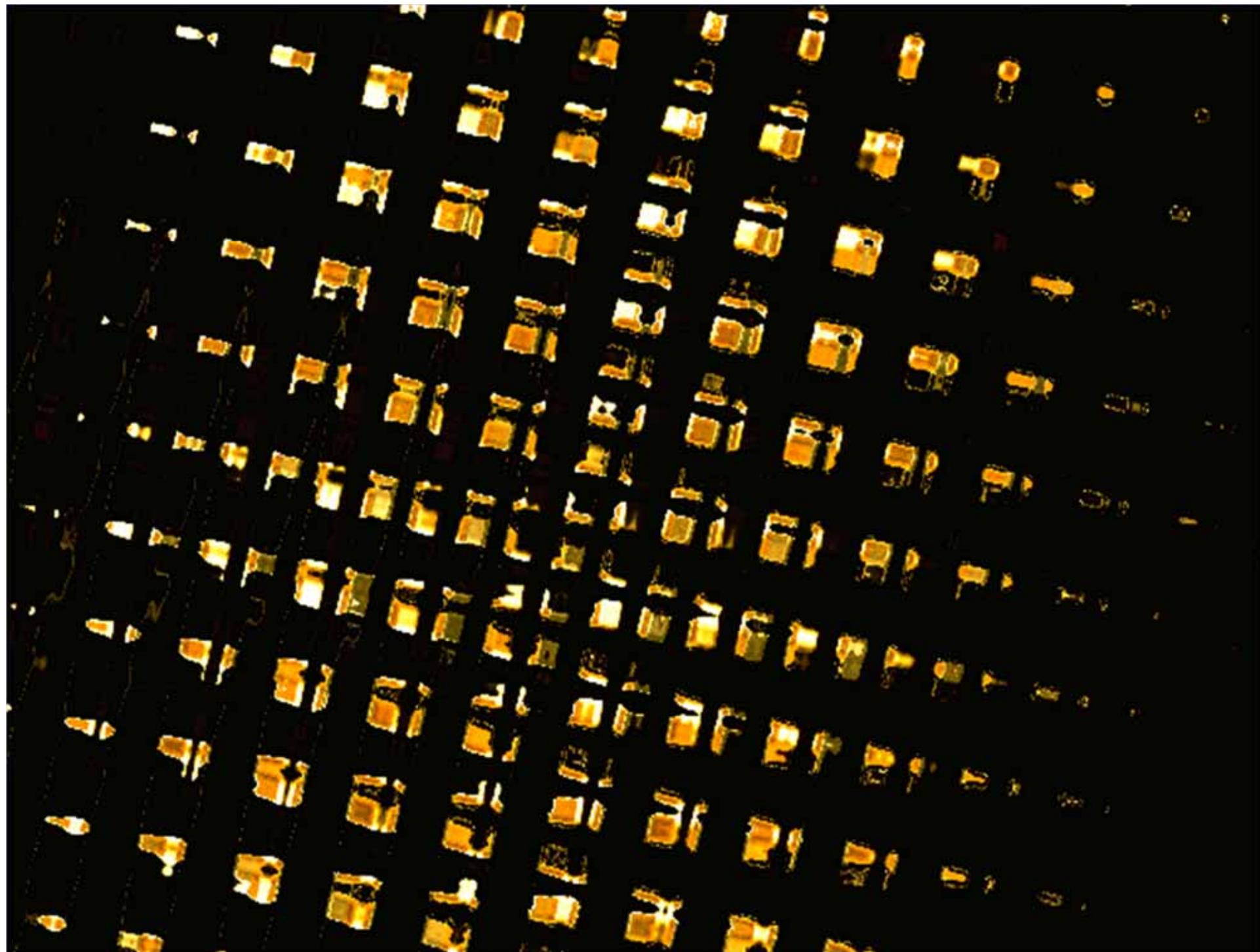
Reward predicted  
No reward occurs



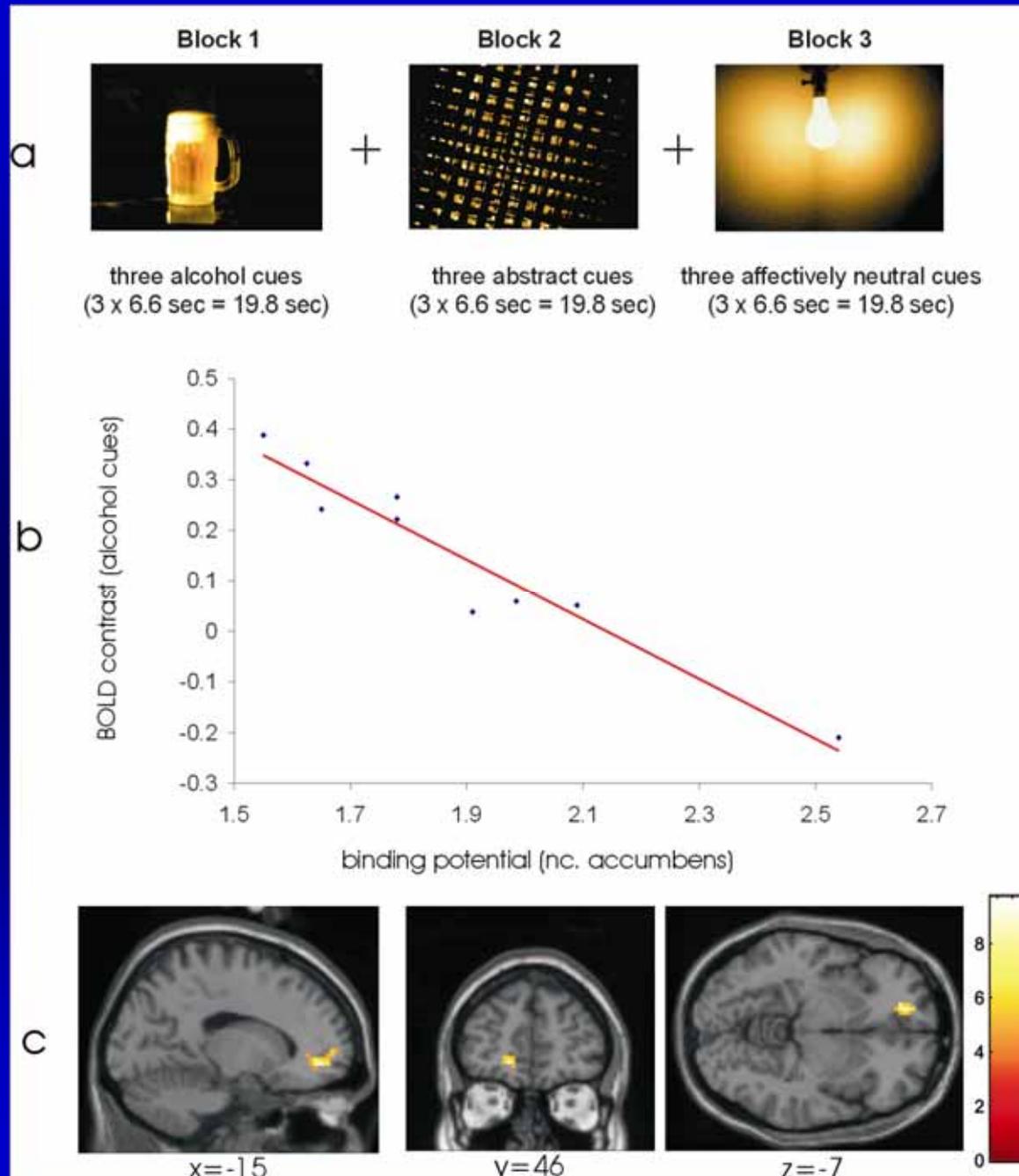
Schultz et al.,  
Science 1997

R erhalten = 0,  
R erwartet = 1:  
 $0 - 1 = -1$







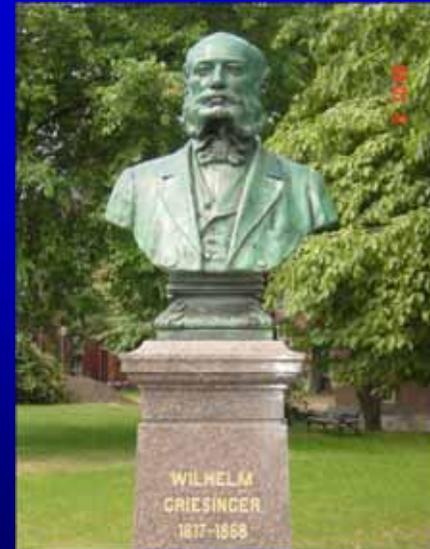


Heinz et al.,  
AJP 2004

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