



La “strana” relazione tra corpo e psiche nell’anoressia: malnutrizione e iperattività motoria

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- ADHD
- Fase Maniacale
- Depressione agitata

Anoressia & iperattività motoria

- Esercizio fisico eccessivo e compulsivo
 - Di compenso
 - Non di compenso

 - Con attività sportiva
 - Con movimenti routinari

Il modello activity based anorexia

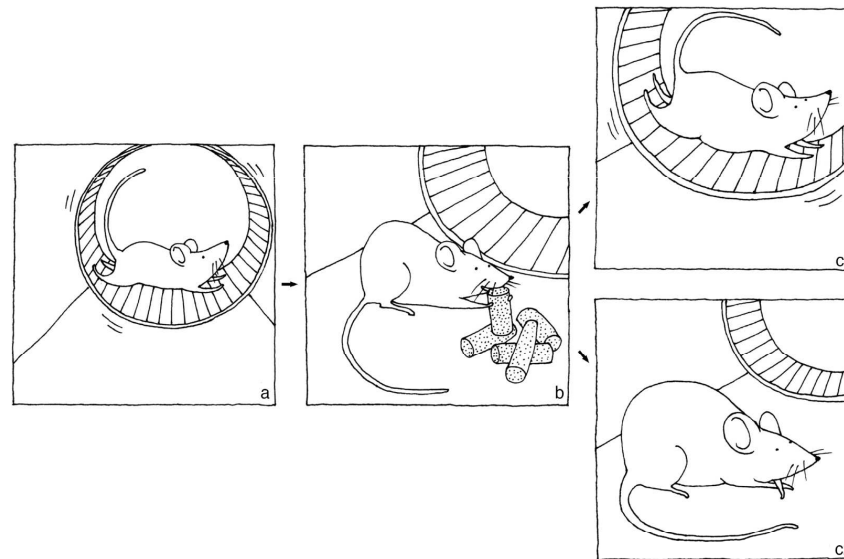


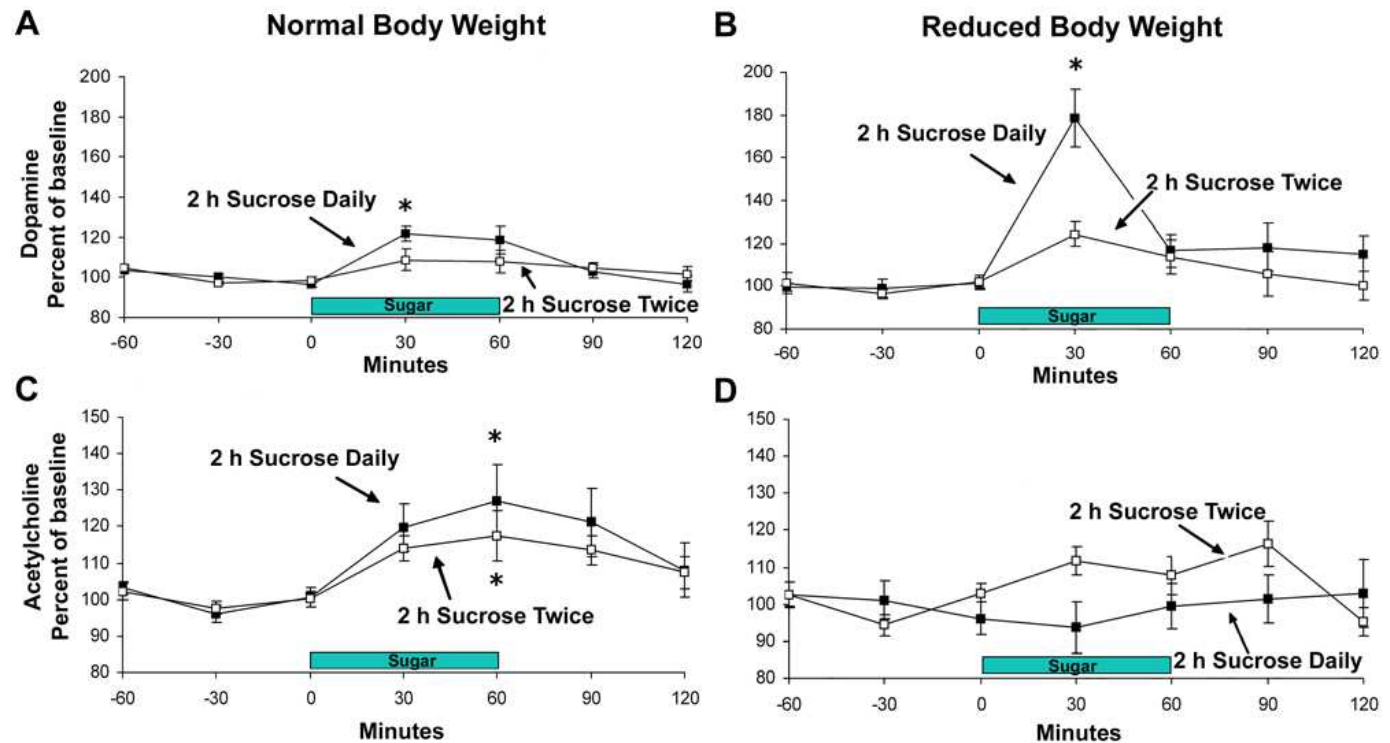
Figure 8 | Change in body weight in relation to individual pre- and postprandial hyperactivity in rats in the activity-based anorexia (ABA) model. (a): Rats in the ABA model (scheduled feeding and access to running wheel) manifest hyperactivity 2–3 hours prior to feeding (food anticipatory activity). This is a general phenomenon. (b): Scheduled feeding. (c1): Rats with a tendency to run more after the feeding period (higher postprandial activity) are subjected to severe weight loss in the ABA model. (c2): Rats running less after the feeding period (lower postprandial activity) are less likely to lose a substantial amount of body weight. Drawing by Stephany Peiyen Hsiao.

Dysregulation of Brain Reward Systems in Eating Disorders: Neurochemical Information from Animal Models of Binge Eating, Bulimia Nervosa, and Anorexia Nervosa

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Interacting Neural Processes of Feeding, Hyperactivity, Stress, Reward, and the Utility of the Activity-Based Anorexia Model of Anorexia Nervosa

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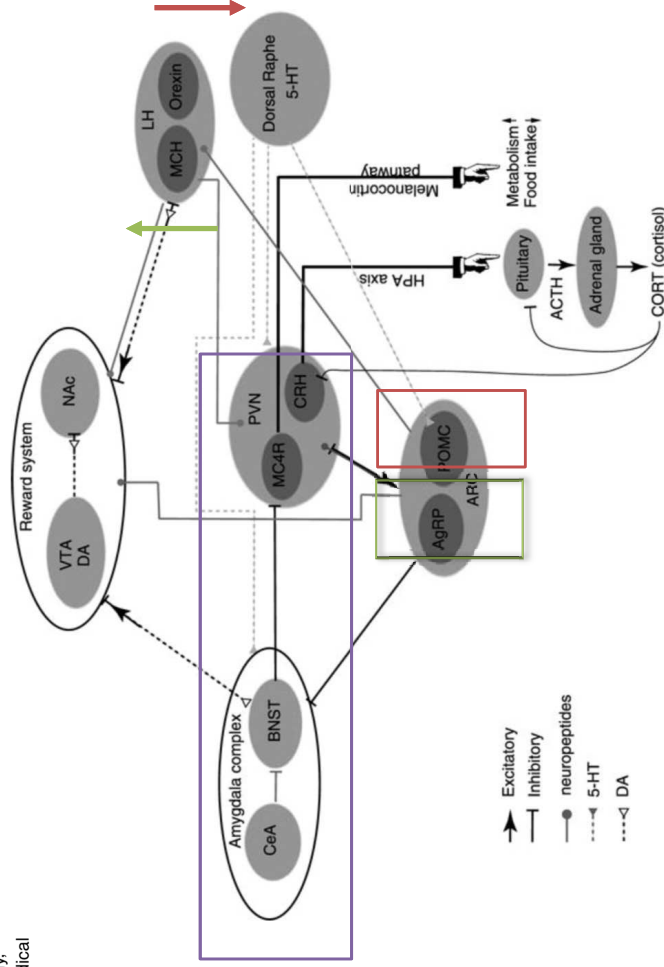


Figure 1.

A simplified scheme of the interlinked neuronal circuits implicated in the regulation of feeding, reward, and stress. The scheme selectively highlights the interaction discussed in regard to anorexia nervosa and the activity-based anorexia rodent model. 5-HT, serotonin; ACTH, adrenocorticotropic; AgRP, agouti-related protein; ARC, arcuate nucleus (hypothalamus); BNST, bed nucleus (stria terminalis); CeA, central amygdala; CORT, corticosterone; CRH, corticotrophin-releasing hormone; DA, dopamine; LH, lateral hypothalamus; MC4R, melanocortin 4 receptors; MCH, melanin-concentrating hormone; NAc, nucleus accumbens; POMC, pro-opiomelanocortin; PVN, paraventricular hypothalamus; VTA, ventral tegmental area.

Rethinking Food Anticipatory Activity in the Activity-Based Anorexia Rat Model

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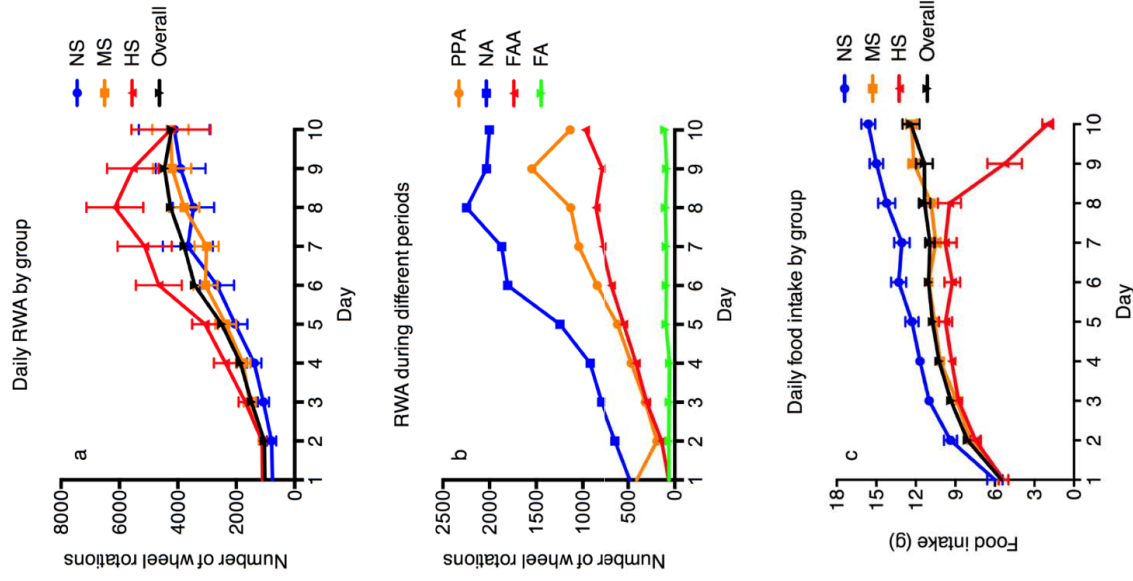
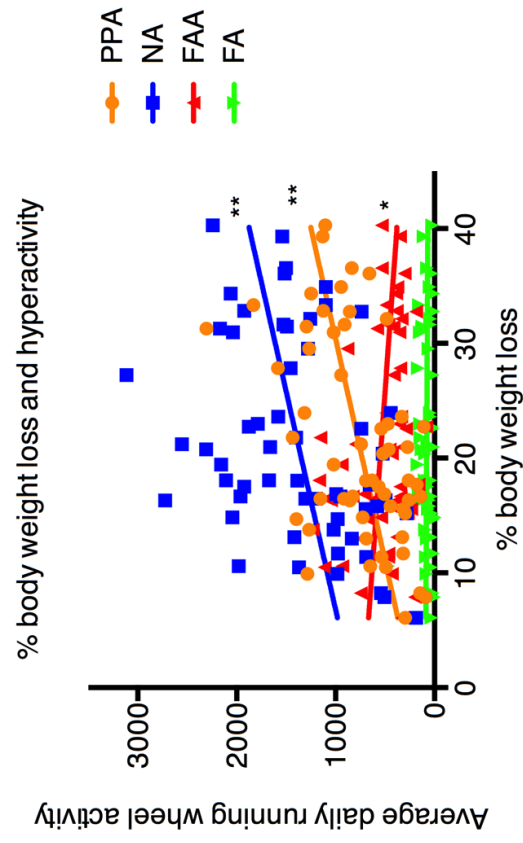
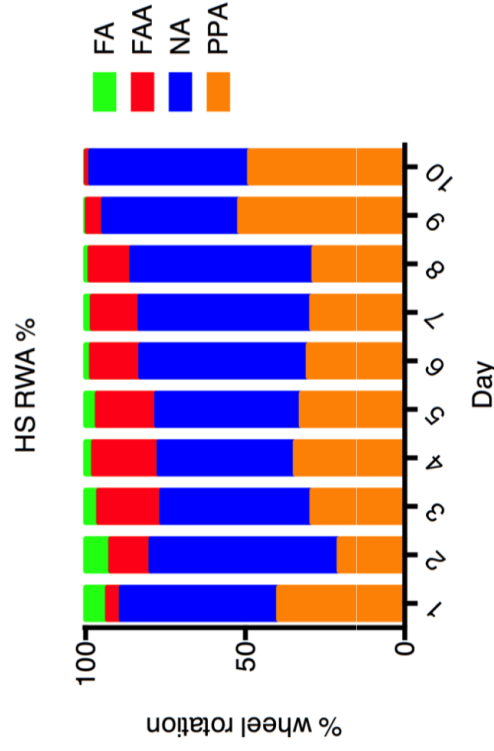


Figure 1 | Evolution of RWA of different groups (1a) and during different periods of time (1b), and evolution of food intake (1c). (1a): Increases in daily RWA were observed in all three groups of rats (most noticeable in the HS group). Daily RWA started to decline in the HS group after day 8, probably related to the increasing weakness of rats nearing the 70% criterion, and early dropouts of the more hyperactive rats. (1b): RWA of all rats during different periods of time, showing a trend of increase in



Olanzapine, but Not Fluoxetine, Treatment Increases Survival in Activity-Based Anorexia in Mice



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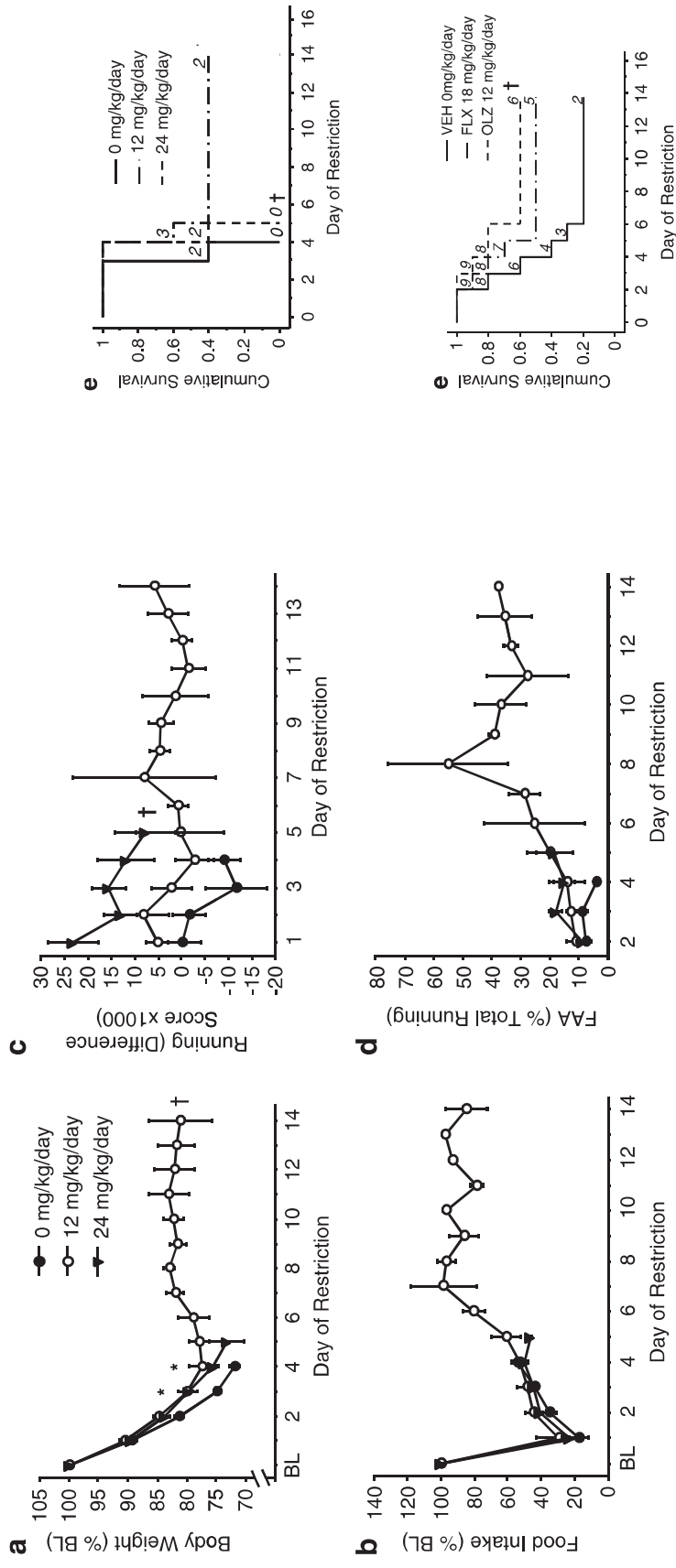


TABLE 3 | Environmental models: main physiological and neurobiological changes observed in rodent models manipulated for one or several factors.

Restrictive anorexia nervosa	Activity-based anorexia (ABA)
Inducing factors Not well known	Inducing factors Voluntary physical activity and time-restricted feeding
Duration Months to years	Duration 3–14 days
Body weight and tissues 20–25% under normal weight (↓fat mass); osteoporosis	Body weight and tissues Stopped over 20–25% of weight loss (↓lean and fat masses)
GH/IGF-1 GH resistance (↑GH ↓IGF-1); ↑SRIF in CSF; ↑SRIF in blood	GH/IGF-1 ?
Reproduction Amenorrhea; ↓LH, FSH, E ₂	Reproduction Stop estrus cycle
Energy metabolism and appetite regulating hormones ↓ Energy expenditure; ↓Leptin; ↓Insulin; ↑Ghrelin (acyl- and desacyl-ghrelin); ↑ adiponectin; ↓Glycemia	Energy metabolism and appetite regulating hormones ↓Leptin; ↓Insulin; ↑Ghrelin (acyl- and desacyl-ghrelin); ↓Glycemia; ↓Free fatty acids
Stress Anxiety-related behaviors and mood disorders; ↑Cortisol; ↓ACTH; →CRH	Stress ↑Corticosterone; ↑Adrenal gland mass; →CRH
Central impact (neuropeptides/neurotransmitters) Morphological alteration of white and gray matter; ↑AgRP/↓NPY; →αMSH in blood; ↓Dopamine metabolites in CSF; ↓D2/D3 density; ↓Serotonin markers	Central impact (neuropeptides/neurotransmitters) ↑AgRP; ↑NPY; ↓POMC; ↓CART; ↓Dopamine during feeding in accumbens nuclei; ↓Serotonin in accumbens nuclei
Key references (30, 31, 169, 170) (review), (14, 18, 38) (review), (32)	Key references (49, 210–215) (review), (216) (review)

phase

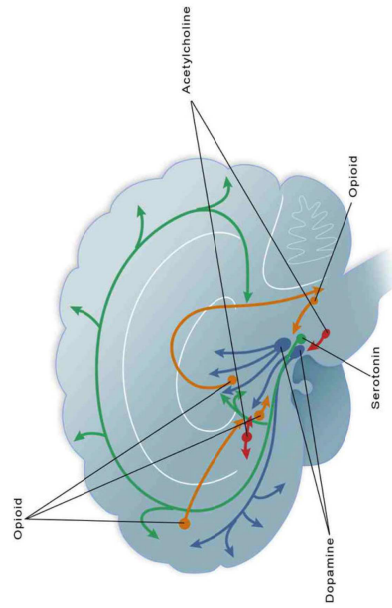


Figure 1. Dopamine (blue), serotonin (green), acetylcholine (red) and the opioids (orange) have each been indicated in disordered eating. This schematic illustrates some of the neuronal projections that research indicates are of particular interest in the regulation and deregulation of food intake as revealed through preclinical and clinical studies of eating disorders.

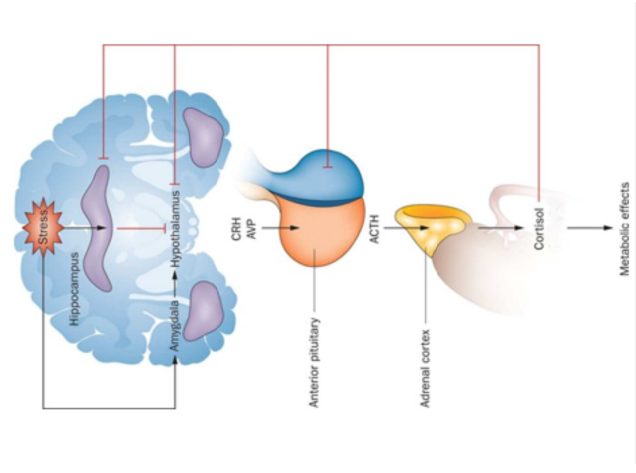


Table 2

Comparison of Expression Levels of the Feeding Neuropeptides of the Hypothalamus in Fasted and Disease States

Peptide/hormone	State of negative energy balance	Anorexia nervosa	Activity-based anorexia rodent model
AgRP	↑ ^{2,93,130,178}	↑ ²²¹	↑ ¹⁷⁸
NPY	↑ ¹⁷⁸	↑ ²²¹	↑ ¹⁷⁸
POMC	↓ ^{87,104,178,203}	↓ ²³⁶	↓ ¹⁷⁸
beta-endorphins	↑ ²⁰⁵	↑ ^{204,207}	↑ ²⁰⁶
CART	Similar to POMC	Similar to POMC	↓ ¹⁷⁸
Orexin	= ¹⁷⁸	↑ ²²²	↑ ¹⁷⁸
MCH	= ¹⁷⁸	—	↑ ¹⁷⁸
CRH	Inconclusive	↑ ^{237,238,239,240}	↑ ^{67,178,234}
Serotonin	↓ ²⁴¹	↓ ²⁴²	↓ ³³
Dopamine	↓ ^{75,77}	↓ ↑ receptor density 243,244	↑ ^{33,245}
Leptin	↓ ²⁴⁶	↓ ^{43,44,45,46,47}	↓ ^{21,178}
Ghrelin	↑ ^{52,53}	↑ ^{54,55}	↑ ⁵⁶
CORT	↑ ⁶⁷	↑ ^{59,60,61,63}	↑ ⁶⁷
Effects of exogenously applied leptin	↓ FI ↑ EE 87,101	Expected to ameliorate hyperactivity and <i>depression</i> ⁴⁷	↓ hyperactivity ^{21,43,248}
Effects of ghrelin	↑ activity AgRP and orexin neurons ^{92,93}	↑ FI ⁵⁷	↑ hyperactivity ⁵⁶
Effects of CORT	↑ activity AgRP and orexin neurons ^{92,93}	—	—

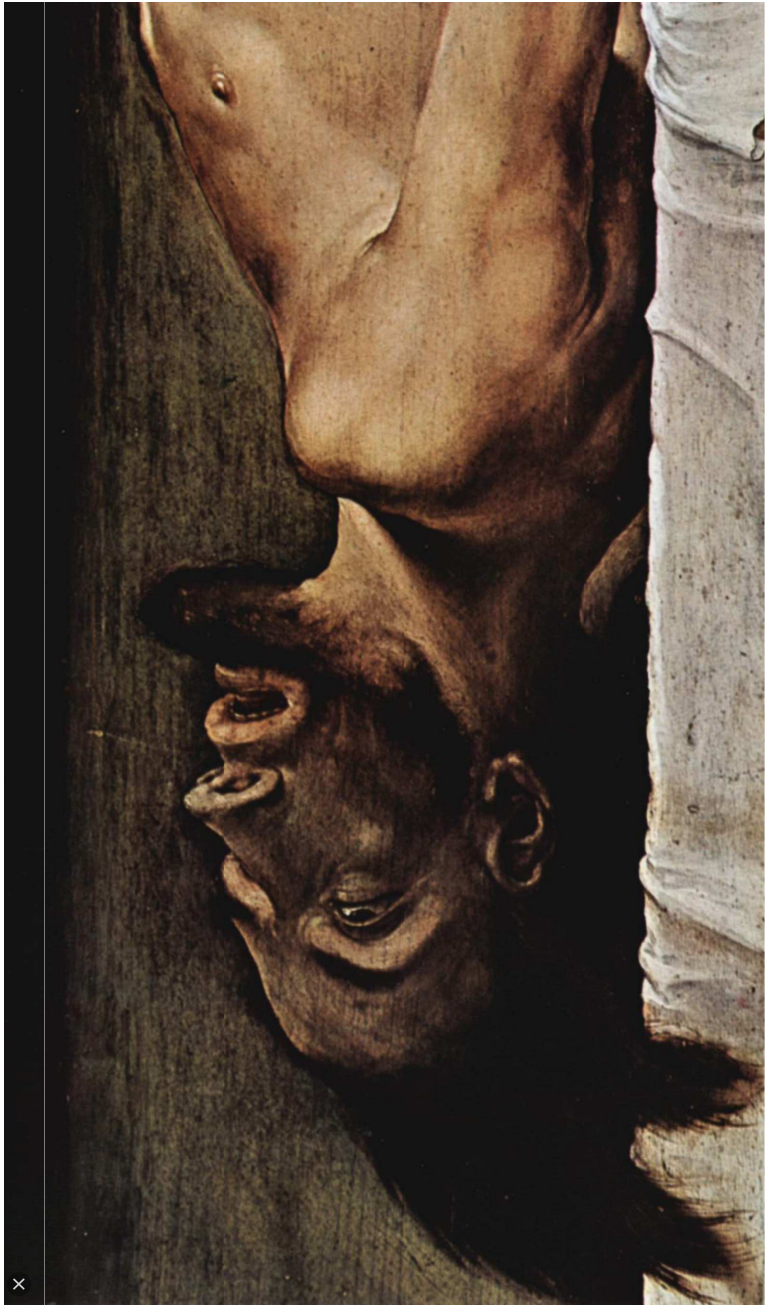
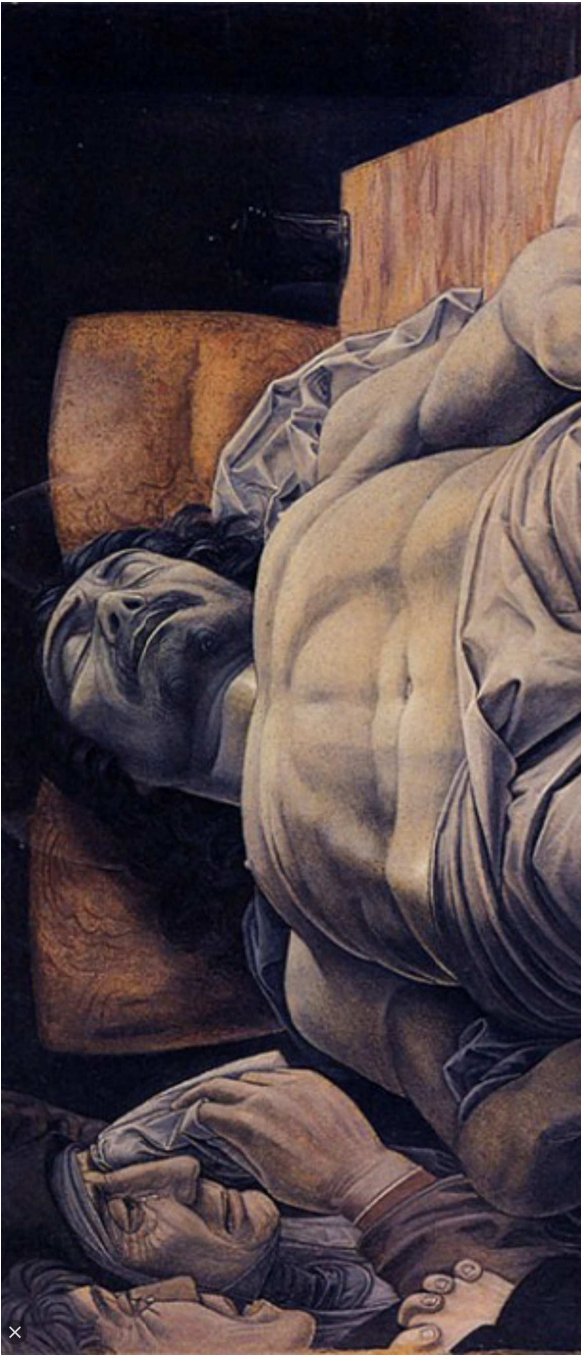
AgRP, agouti-related peptide; CART, cocaine- and amphetamine-regulated transcript; CORT, cortisol or corticosterone; CRH, corticotropin-releasing hormone; EE, energy expenditure; FI, food intake; MCH, melanin-concentrating hormone; NPY, neuropeptide Y; POMC, pro-opiomelanocortin. Studies were performed in **rats**, **mice**, or **humans**.



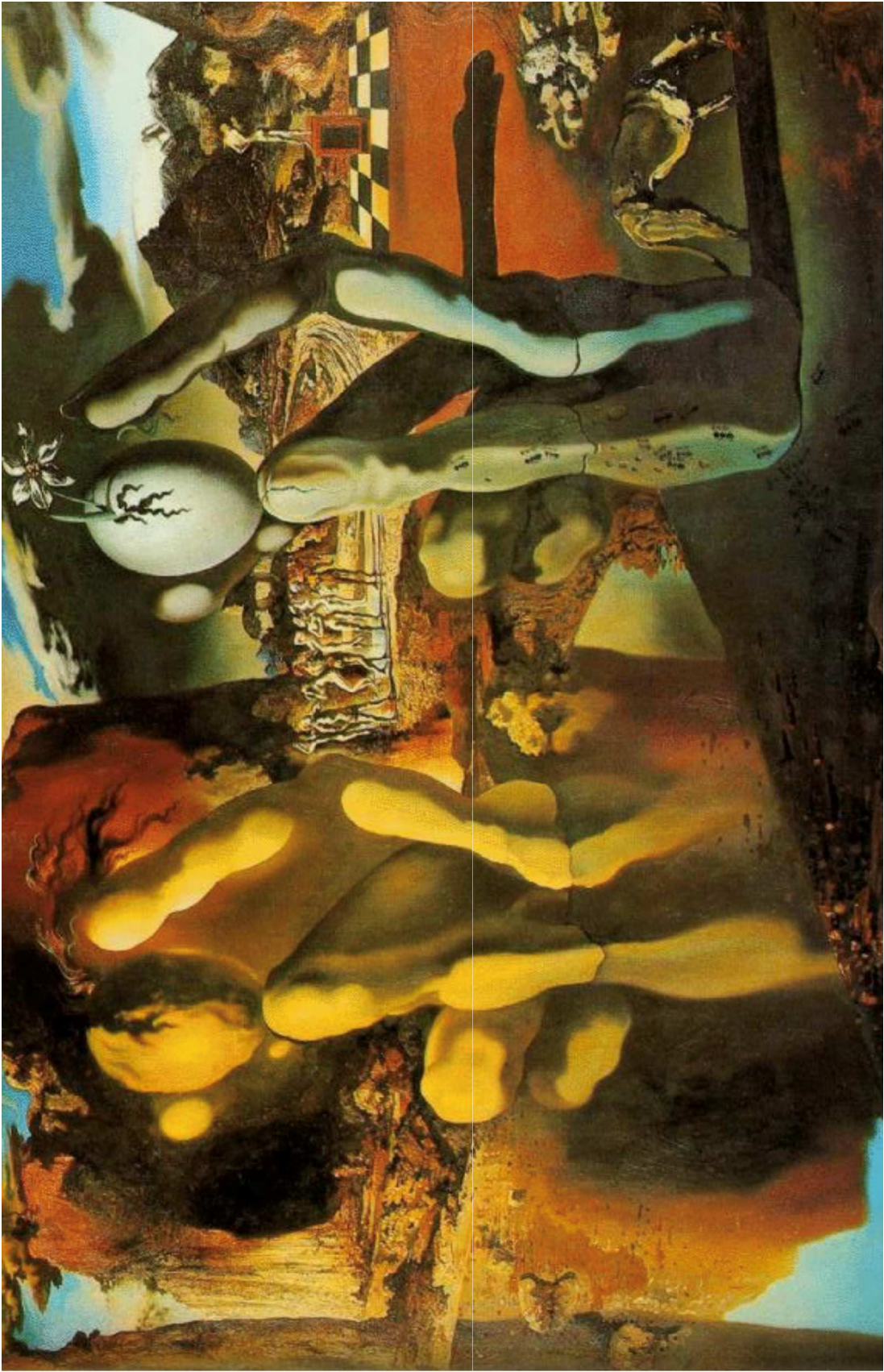
“è un fatto squisitamente umano che l’uomo sia e insieme non sia il suo corpo, che ciò il suo corpo, sia nonostante tutto, una parte come le altre delle sue realtà esterne”

“La psiche è estesa ma non ne sa niente”

“Lasciamo che il sintomo sia quel che è: un evento di corpo, legato al fatto che lo si ha (un corpo)”



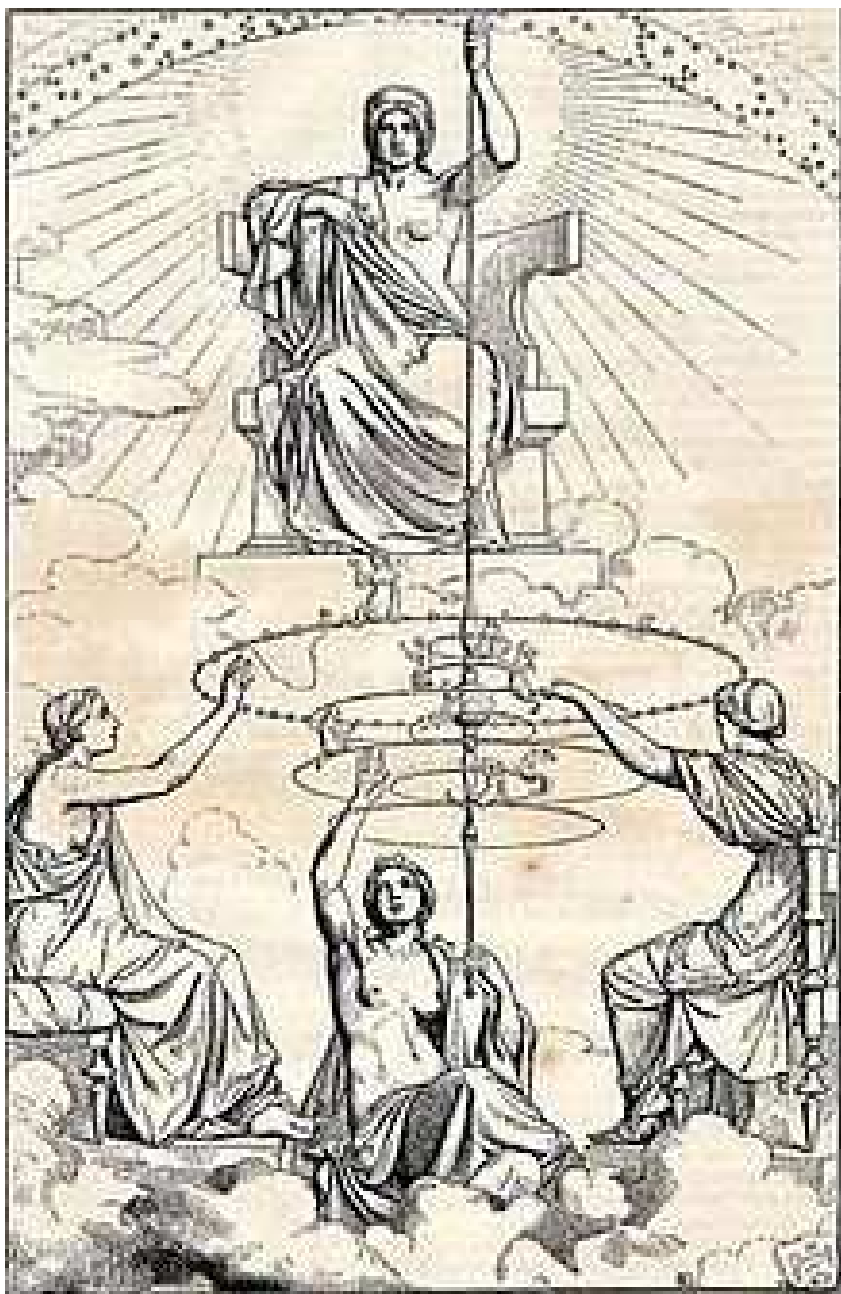




”tesa dall’alto attraverso tutto il cielo e la terra, una luce diritta come una colonna, molto simile all’arcobaleno, ma piú intensa e piú pura. Vi erano arrivati dopo un giorno di marcia e colà avevano veduto, in mezzo alla luce, tese dal cielo, le estremità dei suoi legami. Era questa luce a tenere avvinto il cielo e, come le gomene esterne delle triremi, a tenere insieme tutta la circonferenza. Alle estremità era sospeso il fuso di Ananke, per il quale giravano tutte le sfere.

Platone X Libro Repubblica

Nel mito di Er di Platone ogni anima è posta di fronte alle Moire, figure che rappresentano il controllo del tempo. Le moire sono Lachesi (il tempo passato) Cloto (il presente) e Atropo (futuro). La prima accoglie le anime, secondo Platone, con questa espressione: “Non sarà un demone a scegliere voi, ma sarete voi a scegliervi il vostro demone.”



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