

Reward ideas and strategies

Abstract

In this article we focus on reward system.

Reward system can be considered the center of our body-mind equilibrium: we have medial reward, leading life, reproduction, needs, and willings; if this is not adequately satisfied, dopamine is converted by dopa-beta-hydroxylase into catecholamines, and habenula regulates the balance so that lateral reward risk to become prevalent, with activation of HPA axis (hypothalamus-pituitary gland-adrenal glands), with all the negative effects typical of most diffused world diseases.

Reward can be somehow identified with the TCM three treasures: qi (energy), shen (psyche = ψυχή = jing (the reproductive essence, created thanks to the ministerial fire of ming men, an extraordinary kidney function).

Reward can be synthesized as the summa of our needs: so the secret for a happy life, as 5000 years ago revealed Ayurveda Tradition and 3000 years ago Traditional Chinese Medicine followed, is a correct lifestyle... it mainly means: following our needs in a balanced way.

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Opinion

Dora and Fatih, seeing that Occidental Medicine tends to prefer practical observations than traditional knowledges (based also on medicine and health practise), taking inspiration by works by Esch and Stefano,... we created a REWARD STRATEGY symbol that contains all the pillars for a good lifestyle:

- Diet: for example mediterranean diet, knowing that nowadays, as in oriental health systems, quality is becoming important as quality
- Fitness: 1 hour fitness per day is suggested (average)
- Mind: have a relaxed mind (alpha waves too) is basis for wellbeing
- Love life: love life is a genetical need, that's why affective life is a human right, and of course in reward view it's the best way to make medial reward prevale, and for TCM it's the essential solution to preserve jing, the vital essence
- Sleep: 7-8 hours per night

Extra-rewards: if, for external reasons, despite all this... there risk to be disarmonies, we can recur to CAM for example, since complementary and alternative medicines are the only kind of medicine improving medial reward, that means that they act on BEN the root solving also the BIAO the manifestation (the target for Occidental Medicine). (Figure 1).

Of course we can talk also about the anti-reward, what we can call a micro-damage: if for any external reason reward is not guaranteed, this impact in stochastic way on our wellness (or even deterministic).

Another clue related to reward is synchronization: this is typical and basis for couple love, since love life makes so that two persons (brains, bodies-minds, lives) become synchronized (their EEG become similar), and this is indeed related to a positive medial reward function, that's why privacy is not only a theoretical rule but also a real need... we have to choose the best "synchronizations" we can in order to guarantee to us wellbeing day by day.

We can say that reward is need, is right and is duty too, since health is a duty for us, for our partner, for families and for world society too,

to maintain equilibria inside and outside as well: and health means medial reward that is wellbeing and wellness.



Figure 1 Reward for life.

Main text and discussion

Reward system has been discovered in 1954 by Olds and Milner, then studied by Pavlov: he experimented the conditioning in guinea pigs and dogs, related to reward functions; if we link something to a reward response, this becomes a reflex for animal beings. Then Oades discovered the VTA, ventral tegmental area, the main core for dopaminergic pathways: in monkeys VTA corresponds to SN substantia nigra, degenerated in PD Parkinson Disease. Some recent studies are done by Dreher, french researcher who published a book in 2009, relating the highest functions as decision making to reward explanations: we choose something if in that perspective medial reward is guaranteed and satisfied. P.S. Grigson from Pennsylvania University also is a researcher and supporter of natural rewards.

The main ideas from reward scientific demonstrations¹ are:

- i. Reward is a dopaminergic, and other neurotransmitters, systems: related to our wellbeing, and to the regulation of all our body-mind unity
- ii. It involves the primitive brain parts, linked with the “highest” functions too: these of course are derived from the first ones, to guarantee life and surviving of living beings and species
- iii. The main areas are: VTA in midbrain, nucleus accumbens, amygdala, habenula, limbic system, hypothalamus-pituitary gland (gonadotropins mainly), and so on, with all the periferic projections involving the balance wellness-stress
- iv. That means that for chineses we have yang and yin, for PNEI we have orthosympathetic vs parasympathetic, and for reward we have lateral reward projections: as adrenal glands or the prevalence of abdominal functions as a consequence; and medial reward, as equilibrium between the 7 chakras, talking according to Ayurveda tradition,² so a good jing energy and a good organs-protections guaranteed by positive systems
- v. We remember that, if lateral reward prevale, so stress is prevalent, we can observe the most common diseases: Mayo Clinic admitted that³ our modern world pathologies are related to stress, such as... lifestyle and mental dysfunctions, reproductive infertility, endocrinological anomalies, allergies and autoimmunity, cardiopaties, gastro-intestinal diseases, reumatological illness and anything related to dysautonomia (ANS autonomous nervous system disregulation)
- vi. Summarizing: reward is the accomplishment of our genetical needs... food, drinking clean healthy water, affective life sex and reproduction, sleep and for human beings a happy life with partner and all our peers⁴
- vii. So reward is needs, is rights ...since needs are rights (since they are a necessity): there are rights to food, right to love and affective life or family, so more generally speaking.. reward is a right Dora & Fatih^{5,6}
- viii. And if health is a duty (World Health Organization and all health societies declare this), to preserve world equilibrium: reward too is a duty, since if we don't follow our best needs, these become stress as we said and so it's better to accomplish a correct lifestyle according to this
- ix. Of course we have an individual reward: as ourselves too, it is deterimed 50% by our genes 50% by environment, since environment impacts on genes, as epigenetic science describe... being these concepts true for us and for the following generations.

Other related ideas, that I found rewing scientific materials⁷ for my acupuncture license thesis are:

- i. Opioids and stress are strictly related and activate themselves reciprocally - studies by Almeida from 1991 - that means that when we are living a stressful condition, this not only leads to somatizations as we said before, but this is related to a reduced opioid capacity, with associated pain sensations; so stimulating opioids, for example with TCM techniques (acupuncture, acupressure, moxibustion), it's a way to counteract stress and lead again to a wellbeing condition
- ii. Opioids can reduce GABA, the main neurotransmitter that counteract DOPamine function - studies by Johnson from 1992⁸

- iii. Opioids and dopamine are related as well: opioids regulate dopamine, restoring a positive equilibrium in reward and dopamine function - studies by Takakura⁹ (that in 2013 demonstrated how acupuncture is related to both perceptions of pain and pleasure, at the same time) and by Chiu¹⁰ (who in 2015 studied that acupuncture as L-DOPA artificial administration, can have a role of organs-protections with positive perfusion and neurogenesis)
- iv. Then opioids regulate also ANS: balancing it and leading to wellbeing condition, as Li Qian¹¹ studied in 2013
- v. And also a great idea: opioids regulate default network, the resting state active areas that are responsible for our consequent conditions of body-mind - study by Dhond¹² in 2008.

So summarizing all that, we can see and say that:

- I. Medial reward is basis for wellbeing
- II. Stress situations are related to lateral reward and is cause of most common diseases
- III. -to live in a wellness condition we have to follow an approach that we can call the Antonovsky's salutogenesis: that means also respecting our needs living them at the best
- IV. -of course all this is fundamental: distinguishing bad from good has always been a philosophical topic – now we know that habenula is involved in that process and that in a somehow obvious way: we choose what is rewarding for ourself, but we should also take into consideration what is rewarding for our species and for the world as well... in each case we instinctively choose the option that produce a better (in quantity and quality) medial reward so lead to an effective wellness condition too, this is a life saving instinct.

Other derived ideas are:

- A. Reward is private: since it is also reproductive fuciones, we have to guarantee that, even because for both TCM and fluxes theories... only if we have a good jing function our health is at its best...¹³ so when we hear about privacy rights and laws:¹⁴ we can ascribe that to neuroscientific reasons also¹⁵
- B. And if we want to point out: this brain structure allows us to classify the ANTI-REWARD idea, the micro-damage: if an external cause make us pass from medial reward to lateral reward, this of obviously a biological damage,¹⁴ so it's a material modification that makes us pass from wellness to stress so to sick risk; if this: or is already deterministic (an external cause provokes a negative effect) or if its has a stochastical effect, it's clearly a biological damage, since health is a right and wellness too
- C. Passing to happier ideas: wedding permits 20years more of life, better also in quality - and the couples who live a better love life are those having a stronger activation of reward pathways at fMRI¹⁶
- D. Talking about strategies: of course the best reward are natural, as we synthetize in the symbol
- E. CAM techniques are also natural and also act on reward system:
 - a. ...ayurveda² is an anciend healing system based on the equilibrium of the 7 chakras = root chakra and sacral chakra corresponding to reproductive functions and sacral plexus, solar

plexus that is abdominal vagal parasympathetic nerve activity, heart, throat that is the speaking function and can maybe also be related with thyroid gland, third eye and crown that are mind and spiritual elements; ayurveda adopts: medical massage, yoga and asana, dietetic principles, kamasutra for improving reproductive and couple life, and mantra to meditate and relax

- b. ...then TCM¹³ is a natural system as well since it's based: on acupuncture, that increases natural opioids stimulating points layed on meridians, and so positively impacts on our yin-yang equilibrium with an ideal circulation of qi and xue (blood), an harmonized shen system (psyche, that is sould from ancient greek tradition also), and as we said...a guaranteed jing; also it's important to practice qi-gong, the physical exercises able to relax mind as well, and TCM dietetic principles based on the nature of foods (acid, bitter, sweet, hot, salted) and on temperatures of foods (cold, fresh, warm, hot) and so on; zen meditation is always suggested, with sutra, the speeches of zen masters, koan, the paradoxes on which to meditate, all these permitting satori, that is the spritual awakening of making conscious the essence
- c. ...so CAM, that are also any natural system and strategies improving our wellbeing, are a natural reward we can choose anytime we want.

We talked about "natural rewards"¹⁷ since some people tend to identify reward with addiction: Esch and Stefano definitively cleared this misunderstanding, since a natural reward lasts for our whole life, and moreover it doesnt involve negative consequences, since it's the ACCOMPLISHMENT of a specie need, individually lived; what we have to search and guarantee is that our basal tone of reward overcome the stress-pain-negativity risk, so an addiction habit doesn't... since it is a temporary solution and the main human needs are not solved by smoking, drinking or using artificial molecules... the solution is introducing into our daily life some strategies that help improving life and regulate day so to have constantly a wellbeing perception (and a correct sense of future), and wellness will be our main condition.

Our project⁴ is defining the pillars for a lifestyle based on medial reward prevalence:

1. Diet- mediterranean diet¹⁸ as we always write is protected by UNESCO since it involves: prevalence of vegetables and fruits, 5 portions all colors per day, then whole grains, some diary products, >2L water per day, some eggs and white meat, mushrooms, fish and dry fruit for omega-3 and omega-6 the "good fats", then almost elimination of red meat (that is unaffordable also from an environmental point of view since it impacts on too much consumption of water and exhaustion of green resources, and it's common know that being vegetarian means living 10years more and in better health).
2. Fitness- we only say now that at least 1hour per day is the goal, related to age and also need of fitness activity, since it's an element useful to balance our stress risks and also leading to an healing and wellbeing condition; fitness can be indoor or outdoor, can be social (as most of sports) or individual, and can be aerobical (burning more fats, since it boosts metabolism) or anaerobical (tonifying muscle mean mass).
3. Mind- it's history that qi-gong or yoga practitioners live longer and better, it seems that these practices help in reducing the cortical waves (overthinking is an illness favoring element), with prevalence of alpha EEG rythms typical of relaxed conditions - mind techniques are also those of mental training:¹⁹ autogen

training or concentration-visualization techniques, or also minfullness, that is a different way of getting conscious about reality.

4. Love life - as TCM said, jing is the basis to transmit to our babies a strong health; jing is feeded by love life, and so reproduction and sex are a regular habit to live happily day by day:^{13,20} it regulates body fluxes balancing them (according to 7 chakras too), it improves so hormones balance, and it restore a correct energy-qi function, it allows also a positive shen-psyche task; of course it's a human right: loving the partner we choose, sharing a life with him-her, and building a family with the babys we plan.
5. Sleep - sleep is another pillar for wellbeing;^{5,6} we should sleep 7-8hours related to ages and sleep needs; it's finally true that quantity is not prevailing over quality... a long sleep poor in quality is worse than a short sleep at best quality... of course quality of sleep depends on the resultant EEG rythm of the whole bed time, so we understand that the previous ideas of reward strategy have to be respected: that is food, rewarding enough to permit us gratification from that, a regulated fitness so to make us relaxed at sleep time, then a positive mind (serotonine is basis for melatonine in pineal gland, since if we are satsfied we can sleep too) and of course a good love life, since ..being this accomplished, parasympathetic is prevalent and medial reward too, so brain is pervaded by positive sensations and this is essential for its relaxation and restoring during sleep.²¹⁻²³
6. Finally as we said, "extra-rewards":⁴ for Antonovsky it was clear that, if we lead a good life, we don't need to go to common doctors... but CAM can be useful, or in a particular stressful moment, or to prevent or cure seasonal diseases, or to strengthen and empower ourselves, why not even becoming more conscious of our life and so getting a resilience, the ability to cope any condition, the soul kind of impassibility of wises. Of course extra-reward are also: spending time with pets, enjoying with family, caring of babies, having fun in our hobbies, and also cultivating our mind and soul with any religious practice we can need.²³⁻²⁶

Conclusion

we hope that reward ideas are liked and shared by any expert or follower and that this can positively impact not only for health practitioners, but also on people and society, since reward is of course neuroscience, and its for sure more a practical scientific explanation of distinguishing bad from good, of how a correct life can be basis for a better world, in which we live, we love, we create our present and future, our trusts, beliefs, and wellness for all.

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Conflicts of interest

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