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Love Promotes Health

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Abstract

Love has consequences for health and well-being. Engaging in joyful activities such as love may activate areas in the brain responsible for emotion, attention, motivation and memory (i.e., limbic structures), and it may further serve to control the autonomic nervous system, i.e., stress reduction. This specific CNS activity pattern appears to exert protective effects, even on the brain itself. Moreover, anxiolytic effects of pleasurable experiences may occur by promotion of an inhibitory tone in specific areas of the brain. Thus, love and pleasure clearly are capable of stimulating health, well-being and (re)productivity: This wonderful biological instrument makes procreation and maintenance of organisms and their species a deeply rewarding and pleasurable experience, thus ensuring survival, health, and perpetuation.

Is love healthy?

Love has consequences for health and well-being. The better we understand the concrete neurobiology of love and its possible secondary implications, the greater is our respect for the significance and potency of love's role in mental and physical health [35]. Love is closely related to the concept of pleasure and 'positive psychology', i.e., joyful mental states, and therefore has become a feature not only of thorough psychological but also basic science research – e.g., neurobiology – and clinical medicine [15,16,19,20].

Love, particularly in the beginning (i.e., falling in love), can sometimes be stressful (Fig. 1). However, it still possesses a strong and overall stress reducing potential [20]. By helping individuals to cope with stressful situations and, at first, survive, love truly represents an essential 'ingredient' of a healthy and satisfying life. Reproduction and sexual behaviors are just one aspect of

love. Community, social support, health and survival (of the individual and the species) clearly indicate further beneficial properties of the biological love concept.

Social support has documented health benefits, and the absence of positive social interactions or social bonds is typically associated with both physical and mental illnesses [1,4,14,17,21,22,23,24,30,37,38]. Understanding the nature of physiological processes that regulate social attachment could also be of value for the treatment or prevention of disorders, such as depression or autism, which may involve dysfunctional social attachment [6,14,25,29,36]. For example, oxytocin is part of an endogenous homeostatic system, i.e., re-balancing. This system has the capacity to increase social attachment and other positive social behaviors, providing additional indirect benefits of sociality [6].

The brain harbors beneficial autoregulatory pathways and salutogenic functions that contribute to health by enabling one's experiences in life – e.g., love – to benefit one's health [14,16,19]. However, science has long neglected these capacities, i.e., self-care potential. Yet, in clinical medicine and particularly in integrative or mind/body medical settings, including certain forms of complementary medicine, these self-healing capacities of the mind-brain construct have become widely popular, and therefore research on the neurobiological and physiological pathways underlying such 'healthy' phenomena as love, or therapeutic touch etc., has now gained recognition, i.e., funding [11,13,16].

Professional clinical programs have recently evolved that rely on sophisticated research and use integrative medicine or stress management techniques and approaches: Stress management is a form of medical life style modification towards a healthier or more stress-resistant life (particularly with regard to hardiness against stress-associated disease processes) that has now proven to be efficient in a broad array of diseases and conditions, namely cardiovascular, immune, and neurological or psychiatric disorders, including prevention [14,16,34,51]. In other words: Stress management may improve health [4,13]. Hence, stress management techniques regularly include social support, meditation/relaxation techniques, and other pleasurable activities that induce feelings of well-being and protection, thereby facilitating positive affect, resilience, spirituality, "loving-kindness," compassion, and closeness or connectedness – states that resemble the love concept as discussed above [2,4,5, 8,16,31,32,33,52]. Clearly, these activities and experiences have proven to be biologically and medically beneficial, that is, they help to stay healthy throughout the challenges of life or improve the healing process [14,26,45]. The placebo response may also be named here, since it depends on positive therapy expectations, trust or belief, and it potentially acts via the same neuronal reward pathways related to love, pleasure, motivation and behavior [9,15,16,19,39,46,48, 54]. Effects may thus be observed on psychological or physiological levels, i.e., mind and body, truly indicating a holistic medical understanding of health and its secondary implications.

Love and compassion, i.e., loving-kindness, are integrated in mindfulness trainings such as mindfulness-based stress reduction [5,8,26]. Loving-kindness meditation has been used for centuries in the Buddhist tradition to develop love and transform anger into compassion [5]. In a recent pilot study, this type of intervention, delivered as an eight week program, helped to reduce chronic pain, psychological distress, and anger [5].

Positive emotions, compassion and happiness help us to feel better, particularly in stress, and further they improve bodily functions: Love, compassion and joy make our immune system function better and help to battle diseases [8,13,14,16,19,28]. Furthermore, current research on these topics made the wellness

concept evolve from a sometimes esoteric or non-scientific background and become a major focus of progressive medical science [15,16,27,28,47,53]. Well-being therefore is now acknowledged and recognized as a powerful behavioral tool for supporting motivation and decision making, that is, choosing activities that engage rather than numb our minds: If we heed what gives us immediate pleasure and if we are skeptical of our 'error-riddled' memories and predictions, we can learn to spend our money, time and attention in ways that make us happier [19,27,28,42,53].

Survival and reproduction depend on the ability to adapt patterns of social and reproductive behaviors to environmental and social demands, i.e., flexibility [6]. Moderate pleasurable experiences, however, are able to enhance biological flexibility, complexity and health protection [12,14,19]. Thus, pleasure can be a resistance resource, or it may serve salutogenesis and prevention [11,19]. Furthermore, love and pleasure facilitate trust and belief into the body's capability of restoring or maintaining health, i.e., self-healing capacities [44,48]. Thereby, pleasure promotes the desired state of dynamic balance illustrated above [12,19].

In humans, cognition and belief are vital for reward and pleasure experiences [16]. Social contacts, in addition, provide pleasure, hence survival [11,12,14]. These functions of love and pleasurable experiences may even stimulate personal growth and development [7,19,40,41,43,49]. Findings depicted in this work therefore indicate a fine balance between different physiological states and activity patterns of CNS regions involved in love and attachment formation [20]. This dynamic balance has to be maintained to promote healthy social interactions and relationships, which usually form the base of efficient reproductive behaviors [3,6,50]. On the other side, knowledge obtained in this area may also help to understand diseases or states where underlying brain circuitries are interrupted, i.e., malfunctioning.

Taken together, engaging in joyful activities such as love may activate areas in the brain responsible for emotion, attention, motivation and memory (i.e., limbic structures), and it may further serve to control the ANS, i.e., stress reduction [14,15,16,17,18,19,21,22,23, 45,46,47]. This specific CNS activity pattern appears to exert protective effects, even on the brain itself [14,16]. Moreover, anxiolytic effects of pleasurable experiences may occur by promotion of an inhibitory tone in specific areas of the brain [10,19]. Thus, love and pleasure clearly are capable of stimulating health, well-being and (re)productivity: This wonderful biological instrument makes procreation and maintenance of organisms and their species a deeply rewarding and pleasurable experience [3], thus ensuring survival, health, and perpetuation.

Conclusions

Love and pleasure carry the ability to heal or facilitate beneficial motivation and behavior, in addition to ensuring survival of individuals and their

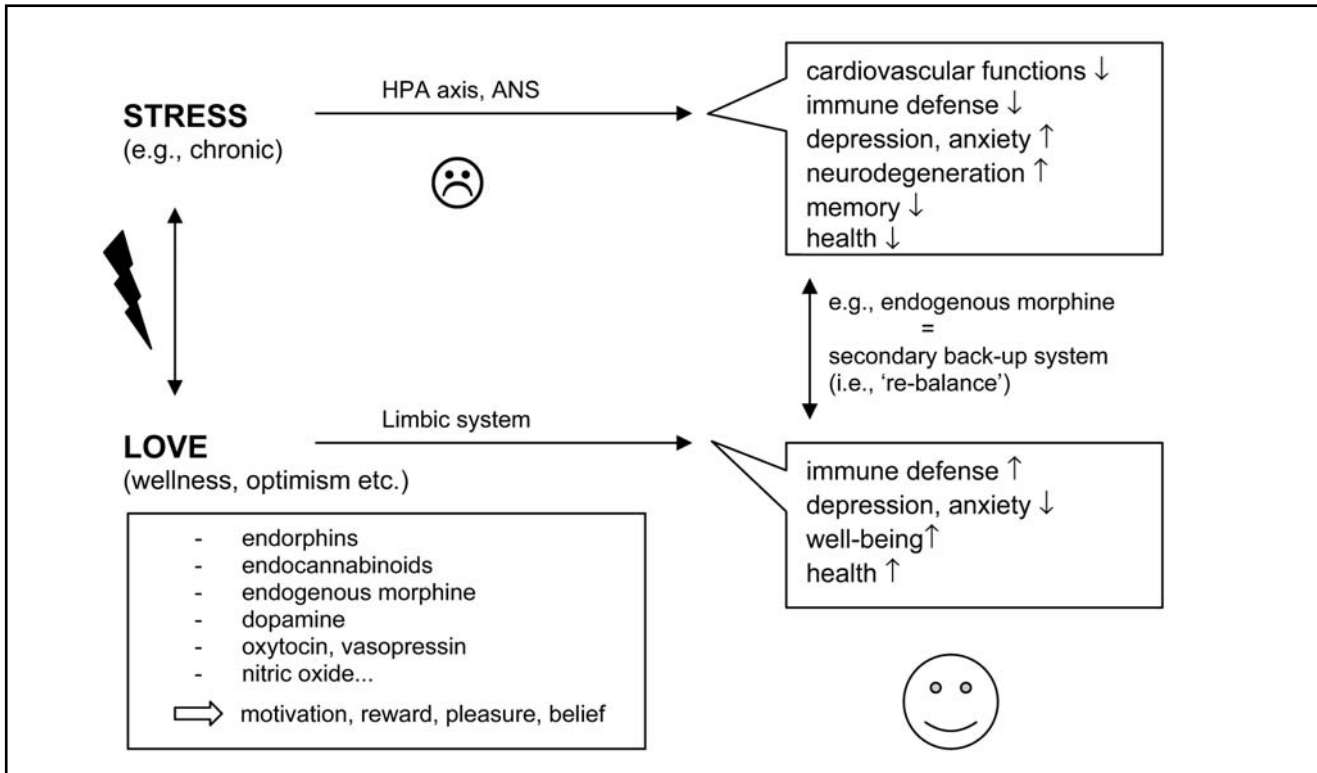


Figure 1. Love and Health. Stress and love act as counter players: Adrenal steroids, related to the HPA axis, are particularly responsive to social and environmental demands, e.g., stress [6,17,21,23]. Under certain conditions, stressful experiences and HPA axis activity are followed by increased sexual, parental, and social behaviors or the formation of social bonds, thereby possibly reducing stress, that is, chronic stress in particular. Adrenal steroid-neuropeptide interactions, involving oxytocin and its receptors as well as other neuropeptides, may regulate the development of social attachments, while concurrently modulating the HPA axis [6]. Positive social behaviors, mediated through these same signaling systems, modulate HPA and ANS activity, thereby accounting for health benefits that are attributed to love and attachment. Taken together, love counteracts chronic stress. However, love itself, i.e., falling in love, can induce stress, which may then promote a state of arousal necessary for approach and appetitive behaviors or the overcoming of neophobia leading to attachment formation or social bonding. After all, love serves to enhance a sense of well-being and safety, using neurobiological means and physiological pathways for the support of social bonds, i.e., community. HPA – hypothalamic-pituitary-adrenal (axis); ANS – autonomic nervous system.

species. After all, love is a joyful, yet useful, activity that encompasses wellness and feelings of well-being – a rather holistic and integrative medical procedure! However, now we might only add little parts to the framework, including a possible involvement of endogenous opiate compounds in love-related signaling processes, leaving most of the questions open for further research.

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Jacques Prévert: Pour faire le portrait d'un oiseau

Pour faire le portrait d'un oiseau

*Peindre d'abord une cage
avec une porte ouverte
peindre ensuite
quelque chose de joli
quelque chose de simple
quelque chose de beau
quelque chose d'utile
pour l'oiseau
placer ensuite la toile contre un arbre
dans un jardin
dans un bois
ou dans une forêt
se cacher derrière l'arbre
sans rien dire
sans bouger ...
Parfois l'oiseau arrive vite
mais il peut aussi bien mettre
de longues années
avant de se décider
Ne pas se décourager
attendre
attendre s'il le faut pendant des années
la vitesse ou la lenteur de l'arrivée
de l'oiseau
n'ayant aucun rapport
avec la réussite du tableau
Quand l'oiseau arrive
s'il arrive
observer le plus profond silence
attendre que l'oiseau entre dans la cage
et quand il est entré
fermer doucement la porte avec
le pinceau
puis
effacer un à un tous les barreaux
en ayant soin de ne toucher
aucune des plumes de l'oiseau
Faire ensuite le portrait de l'arbre
en choisissant la plus belle de ses branches
pour l'oiseau
peindre aussi le vert feuillage et
la fraîcheur du vent
la poussière du soleil
et le bruit des bêtes de l'herbe
dans la chaleur de l'été
et puis attendre que l'oiseau
se décide à chanter
Si l'oiseau ne chante pas
c'est mauvais signe
signe que le tableau est mauvais
mais s'il chante c'est bon signe
signe que vous pouvez signer
Alors vous arrachez tout doucement
une des plumes de l'oiseau
et vous écrivez votre nom dans un
coin du tableau.*

Jak namalovat portrét ptáka

*Musíte nejdřív namalovat klec
s otevřenými dvířky
pak namalovat
pro ptáka
něco krásného
a prostého
a milého
co ptáka přiláká
postavit plátno poblíž stromu
na zahradě
v hájku
nebo v lese
ukrýt se za strom
a mlčet
nehnout ani brvou...
Někdy pták přiletí hned se vši kuráží
a jindy váhá celé roky
než se odváží
Nesmíte ztratit trpělivost
čekat
čekat třeba celou věčnost
Čas čekání
však není nijak úměrný
kvalitě obrazu
Když konečně pták přiletí
pokud přiletí že
musíte mlčet z hloubi duše
počkat až vletí do klece
a když je uvnitř
musíte zlehka zavřít štetcem dvířka
a potom
smazat všechny mříže
a dávat pozor abyste mu nezkrřivili ani
pírko
Musíte namalovat strom
a najít pro ptáka
tu nejkrásnější větev
a namalovat listí na větvích a svěží vánek
sluneční paprsky
a bzukot hmyzu v žáru léta
a potom čekat až pták začne zpívat
Festliže nezpívá
je to zlé znamení
znamení že obraz není k ničemu než k
vyhození
Když zpívá je to dobré znamení
znamení že obraz je bez kazu
Zlehynka vytrhněte
jedno z ptačích per
a napište své jméno v rohu obrazu.*

(in Czech)

To paint a bird's portrait

*First of all, paint a cage
with an opened little door
then paint something attractive
something simple
something beautiful
something of benefit for the bird
Put the picture on a tree
in a garden
in a wood
or in a forest
hide yourself behind the tree
silent
immovable...*

*Sometimes the bird arrives quickly
but sometimes it takes years
Don't be discouraged
wait
wait for years if necessary
the rapidity or the slowness of the arrival
doesn't have any relationship
with the result of the picture*

*When the bird comes
if it comes
keep the deepest silence
wait until the bird enters the cage
and when entered in
Close the door softly with the brush
then remove one by the one all the bars
care not to touch any feather of the bird*

*Then draw the portrait of the tree
choosing the most beautiful branch
for the bird
paint also the green foliage and the coolness
of the beasts of the grass in the summer's heat
and then, wait that the bird starts singing*

*If the bird doesn't sing
it's a bad sign
it means that the picture is wrong
but if it sings it's a good sign
it means that you can sign*

*so you tear with sweetness
a feather from the bird
and write your name in a corner
of the painting*

(in English)