

Mathematical Theory of Love

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Abstract: The Mathematical Theory of Love is based on the following axioms: a) everyone is able to love; b) an individual "i" love value can be expressed as a term L_i ; c) L_i love value can vary over time: $L_i(t)$. As per the First Theorem of Love, individual love value L_i can be expressed according to the following equation: $L_i(t) = L_1 + L_2 + EK \times LC(t)$; where L_1 : individual love value coming from past lives; L_2 : individual love received during the first ten (10) years of the individual lifetime; EK: *Environment Kindness* where the individual lives; and LC: the individual *Level of Consciousness* of Love. As per the Second Theorem of Love, the group love value is the summation of all individuals love values forming that group: $L_g(t) = L_1 + L_2 + \dots + L_i + \dots + L_n = \sum_{i=1}^n L_i(t)$; where: L_g : total summation of all individuals "i" love value forming this group (i=1 through n); and L_i : individual "i" love value. The individual Level of Consciousness function $LC_i(t)$ is exponential and can be expressed as follows: $LC_i(t) = C_{LC} \times t^p$.

Keywords: individual love; mathematical theory; love theorem; group love; level of consciousness; environmental kindness.

Introduction

Love is the strongest force the Universe possesses. Love gives us life, food, and safety. Love allows us to be born, grow, live, learn, and develop our spirit. Without Love we cannot progress nor feed our hearts. Love provides us with life and light. Everything is because of Love, the Light that sees our spirits growing.

The Mathematical Theory of Love formalizes Love value in individuals and groups (i.e. family, community, and/or human society).

1. Axioms

Love Mathematical Theory is based on the following concepts:

- a) Everyone is able to love.
- b) An individual "i" love value can be expressed as a term L_i .
- c) L_i love value can vary over time: $L_i(t)$.

2. First Theorem of Love: Individual Love equation

An individual Love value can be expressed as follows:

$$L_i(t) = L_1 + L_2 + EK \times LC(t)$$

Where:

$L_i(t)$: individual Love value at t.

L_1 : individual Love value coming from past lives. It is considered a constant value.

L_2 : individual Love received during the first ten (10) years of the individual lifetime. As of ten (10) years old, L_2 is considered constant.

EK: *Environment Kindness* where the individual lives (i.e. city, town). EK may vary during long periods of time. However, it is considered a constant value for the current analysis.

LC: the individual *Level of Consciousness* of Love as the force that feeds living being's soul. The bigger LC, the more an individual can be aware of the Work of God, more the individual is conscious of being part of a harmonious Universe, and more the individual accepts others as part of himself/herself. The bigger LC the more the individual is aware that his/her well-being is closely related to the others'.

Demonstration:

The First Theorem of Love can be demonstrated statistically by collecting enough data to obtain results predicted. For the moment, it can be identified as a **postulate** due to the fact that it cannot be deduced from another principle.

$L_i(t)$ equation terms are detailed as follows:

- 2.1. **Constant L_1 – Love coming from past lives:** when children are born, they can be considered emotional “blank pages” just starting their life. However, there is a spiritual background coming from past lives that shape their first steps in life and their relationship with their environment. Babies' capacity of loving is reduced, but there is a natural way of connecting with their parents, relatives, people, and subsequently with their schoolmates, that belongs to them, to their pre-set level of empathy with their social environment. This Love value comes from their past lives.
- 2.2. **Constant L_2 – how much an individual has been loved during the first ten (10) years of lifetime:** children need to be loved unconditionally during their first ten (10) years to have properly set their emotional & spiritual basis for the rest of their life. When children are loved, they “remember” the essence of love, increase their self-esteem, and develop their self-confidence. The more they are loved since the first moment they are conceived, the higher their capability of loving and develop fully as human beings. We were born to love and to be loved; even that sometimes we do not remember it. The more someone is loved, the more is able to feel empathy for others. The more children have been loved at the first stage of their life, the more they will be able to love at a later stage, and the higher their Level of Consciousness will be (refer to item 2.4).
- 2.3. **Environment Kindness – EK:** it represents the influence of the social & natural environment on the individual, and how it can stimulate or not his capability to love. Even that it can change over a long period, EK is considered a constant value.

EK depends on the following factors:

1. Population density (PD): all individuals require a minimum personal space for being comfortable and not feeling overwhelmed by other people. A social environment should have a population density limit, a critical value over which all individuals start to be aggressive to others.

PD factor weight: 10%

2. Spirituality (SP): it is based on the average level of spirituality of the social environment. It can be defined as how much people believe in God, and are certain that Love sustains our lives. The more the amount of people that believe in God and trust Love, the higher the community spirituality is.
SP factor weight: 10%
3. Nature (NA): level of access and contact with nature (landscapes, plants, animals, solar light, fresh air and water coming from natural sources). The higher the contact with nature is, the higher the contact with the work of God is.
NA factor weight: 10%
4. Contact with other people (CP): human beings need to be in contact with others to develop their ability to Love. Contact is not only about being physically with people, but sharing ideas & values, and the probability of interacting with others.
CP factor weight: 10%
5. Respect for the Law (RL): a social environment cannot be kind if there is no respect for the law, determined by the current legal system. Respect for the law can be spontaneous or enforced by correspondent institutions.
RL factor weight: 5%
6. Common living rules (CL): it is related to social behavior for respecting others rights beyond the legal system, like courtesy, ethic, honor, honesty, commitment, responsibility, etc.
CL factor weight: 5%
7. Basic needs (BN): access to food, health care, education and housing.
BN factor weight: 15%
8. Recreation Activities (RA): access to sports practice, physical exercise and entertaining activities (i.e. movie, theater, concerts, museums).
RA factor weight: 5%
9. Personal Fulfillment (PF): a system capability of offering means for personal fulfilling, like vocation identification, degrees addressing people vocation, and a job market that offers opportunities related to degrees obtained.
PF factor weight: 5%
10. Public Transport (PT): access to public transport and/or alternative ways of transportation (i.e. bikes).
PT factor weight: 5%
11. Environment Cleanliness (EC): level of cleanliness of water and air on the community.
EC factor weight: 5%

12. Job access (JA): probability of finding a job that provides people with enough income; or access to a volunteering system that provides with food & housing in exchange.
JA factor weight: 10%

13. Environment Care (EC): level of recycling, reduction and reusing of materials. Level of water & energy efficiency (i.e. electricity, gas). Use of renewables and non-contaminant sources of energy.
EC factor weight: 5%

2.4. **Level of Consciousness – LC:** consciousness of being part of an essentially harmonious Universe. An individual capability of living in a community where the *Law of Love* rules over the social system. Level of consciousness is not a rational thinking, but a way of living that involves emotionality and rationality, heart and brain. The higher the *Level of Consciousness* is, the higher the individual Level of Love (A_i) is.

For this analysis, the Level of Consciousness is a variable dependent on time. $LC_i(t)$ is the only non-constant term in the $L_i(t)$ equation:

$$L_i(t) = L_1 + L_2 + EK \times LC(t)$$

$L_i(t)$ is proportional to $LC_i(t)$: the higher an individual Level of Consciousness is, the higher the individual Level of Love is, and vice versa.

3. **Corollary 1: Group Love is the summation of all individuals love values**

A group love value is the summation of all individuals' love values forming that group:

$$L_g(t) = L_1 + L_2 + \dots + L_i + \dots + L_n = \sum_{i=0}^n L_i(t)$$

Where:

L_g : total summation of all individuals "i" love value forming this group (i=1 through n).

L_i : individual "i" love value.

4. **Second Theorem of Love: The derivative of the Group Love function with respect to time is equal or greater than 0.**

$$\frac{dL_g}{dt} \geq 0$$

Group Love capability of growth increases over time: the higher L_g value is, the higher L_g capability of growth is.

Demonstration:

In order to simplify, the following binary values will be assumed for $L_i(t)$:

- Individual i loves: $L_i(t) = 1$
- Individual i does not love: $L_i(t) = 0$

a) Group Love value at t_0 : $L_g(t_0)$

Group Love is the summation of all individual values $L_i(t_0)$:

$$L_g(t_0) = \sum_{i=0}^n L_i(t_0) = L_1(t_0) + L_2(t_0) + \dots + L_j(t_0) + \dots + L_n(t_0)$$

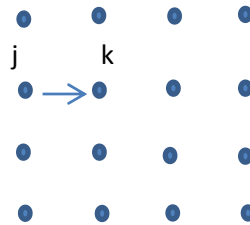
Let us suppose no individual "i" loves in t_0 . This means all $L_i(t_0)$ values are equal to 0. Hence, Group Love value at t_0 will be:

$$L_g(t_0) = \sum_{i=0}^n L_i(t_0) = 0 + 0 + \dots + 0 + 0 + 0 = 0$$

$$L_g(t_0) = 0$$

b) Group Love value at t_1 :

Let us suppose that individual "j" loves individual "k" in t_1 . Graphically, it can be shown as follows:



Group Love will be:

$$L_g(t_1) = \sum_{i=0}^n L_i(t_1) = L_1(t_1) + L_2(t_1) + \dots + L_j(t_1) + L_k(t_1) + \dots + L_n(t_1)$$

All $L_i(t_1)$ will be equal to 0 except for $L_j(t_1) = 1$. Hence, Group Love value will be:

$$L_g(t_1) = \sum_{i=0}^n L_i(t_1) = 0 + 0 + \dots + 1 + 0 + 0 = 1$$

$$L_g(t_1) = 1$$

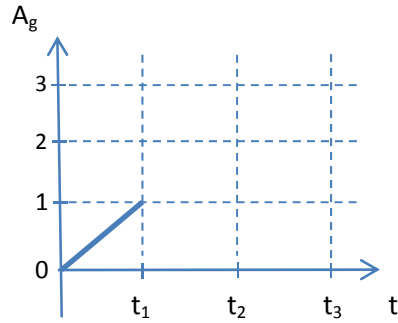
Change L_g from t_0 through t_1 is as follows:

$$\frac{\Delta L_g(t_1)}{\Delta t} = \frac{L_1 - L_0}{t_1 - t_0} = \frac{1 - 0}{1 - 0} = 1$$

That is:

$$\frac{dL_g(t_1)}{dt} = 1$$

The derivative of $L_g(t)$ at t_1 with respect to time is equal to 1.



c) Group Love value at t_2 :

In t_2 :

- Individual "j" keeps on loving individual "k": $A_j(t_2) = 1$
- Individual "k" does not love yet, because is still processing being loved by "j": $A_k(t_2) = 0$

Group Love value at t_2 is:

$$L_g(t_2) = \sum_{i=0}^n L_i(t_2) = L_1(t_2) + L_2(t_2) + \dots + L_j(t_2) + L_k(t_2) + \dots + L_n(t_2)$$

All $L_i(t_2)$ values are equal to 0, except for $L_j(t_2) = 1$. Hence, Group Love will be:

$$L_g(t_2) = \sum_{i=0}^n L_i(t_2) = 0 + 0 + \dots + 1 + 0 + 0 = 1$$

$$L_g(t_2) = 1$$

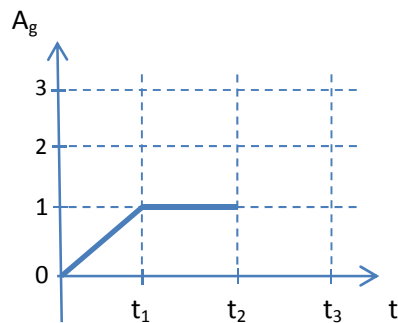
Change L_g from t_1 through t_2 is as follows:

$$\frac{\Delta L_g(t_2)}{\Delta t} = \frac{L_2 - L_1}{t_2 - t_1} = \frac{1 - 1}{1 - 0} = 0$$

That is:

$$\frac{dL_g(t_2)}{dt} = 0$$

The derivative of $L_g(t)$ at t_2 is equal to 0.



d) Group Love value at t_3 :

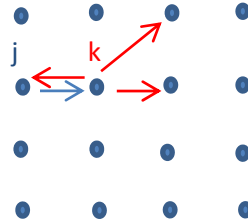
When someone loves, someone else becomes the subject of this love. When someone loves, the seed of Love is planted in the beloved person. After being loved by individual j, individual k will be able to love at a later time, not only by loving back individual j but by loving others as well. The Love seed multiplies the individual capability of loving, not only those who loved him, but also other people.

It is assumed that beloved individual k will turn into someone who loves at t_0+2 .

Hence, at t_3 :

- Individual j keeps on loving individual k at t_3 : $L_j(t_3) = 1$
- Individual k starts loving back individual j, but also starts loving others. Let us assume individual k loves two (2) other individuals: $L_k(t_3) = 3$.

Graphically is as follows:



$$L_g(t_3) = \sum_{i=0}^n L_i(t_3) = L_1(t_3) + L_2(t_3) + \dots + L_j(t_3) + L_k(t_3) + \dots + L_n(t_3)$$

All $L_i(t_3)$ values are equal to 0, except for $L_j(t_3) = 1$ and $L_k(t_3) = 3$. Group Love will be:

$$L_g(t_3) = \sum_{i=0}^n L_i(t_3) = 0 + 1 + \dots + 3 + 0 + 0 = 4$$

$$L_g(t_3) = 4$$

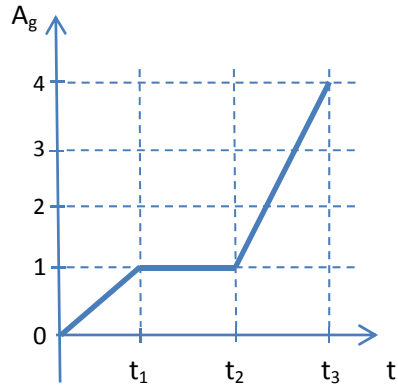
L_g change from t_2 through t_3 is:

$$\frac{\Delta L_g(t_3)}{\Delta t} = \frac{L_3 - L_2}{t_3 - t_2} = \frac{4 - 1}{1 - 0} = 3$$

That is:

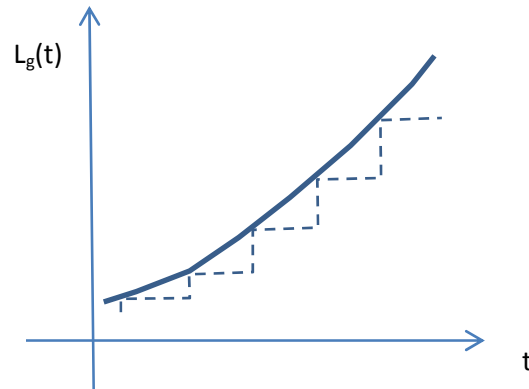
$$\frac{dL_g(t_3)}{dt} = 3$$

The derivative of L_g at t_3 is equal to 3.



Group Love $L_g(t)$ capability of growth increases over time.

It can be deduced that the Group Love function is exponential. Graphically is as follows:



5. Corollary 2: The individual Level of Consciousness function $LC_i(t)$ is exponential

$$\text{If } \frac{dL_g}{dt} \geq 0$$

$\Rightarrow L_g(t)$ is an exponential function

$\Rightarrow L_g(t)$ equation format is as follows: $L_g(t) = C \times t^p$

Hence:

$$\Rightarrow L_g(t) = L_1 + L_2 + \dots + L_i + \dots + L_n = C \times t^p$$

Every individual love function $L_i(t)$ is exponential as well:

$$\Rightarrow L_i(t) = C_i \times t^p$$

$$\Rightarrow L_i(t) = L_1 + L_2 + EK \times LC_i(t) = C_i \times t^p$$

Given that L_1, L_2 and EK are constants:

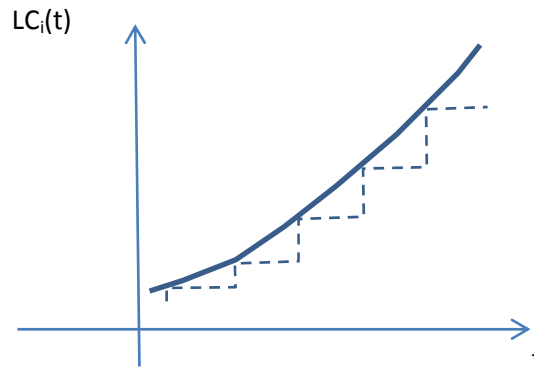
$$\Rightarrow LC_i(t) \sim C_i \times t^p$$

$$\Rightarrow LC_i(t) = C_{LC} \times t^p$$

The individual Level of Consciousness $LC_i(t)$ function is exponential.

Note: $LC_i(t)$ equation constant value C_{LC} is different for each individual. C_{LC} value depends on the individual Level of Consciousness profile.

$LC_i(t)$ graphical representation:



An individual Level of Consciousness growth increases over time, due to the increasing individual loving capability and ability to see the presence of Love in every aspect of the individual's life.

6. Individual love $L_i(t)$ equation terms range

$L_i(t)$ equation terms values are as follows:

6.1. $L_i(t)$ range is 0 through 100

Value range	$L_i(t)$ level	Comment
0 – 40	Emerging	Individuals consider their well-being more important than the others'.
40 – 60	Basic	Individuals love their people (family, community, and town). As of this level, individuals stop being harmful to others.
60 – 80	Developed	Individuals are able to love indistinctly people, regardless of race, religion and/or nationality. They see good in others.
80 - 100	High	Individuals with high capability of loving. They are able to change society and bring Light to our planet.

6.2. $L_i(t)$ equation terms values

$L_i(t) = L_1 + L_2 + EK \times LC(t)$ range values are as follows:

- $L_i(t) \in [0-100]$
 - $L_1 \in [0-20]$
 - $L_2 \in [0-20]$
 - $EK \times LC \in [0-40]$, where:
 - $EK \in [0-1]$
 - $LC \in [0-60]$