Physical Relation Between Emotions And Individuals Possessing Them.

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ABSTRACT: This article focuses on the rationalization of emotions- mainly happiness & sadness- and their interactions. A mathematical analysis of emotions relating happiness and sadness has been depicted. Emotions, being merely a disturbance in the mental states, have been analyzed as an entropic phenomenon.

Introduction

Emotions are abstract sensations that govern the behavioral part of all species, while thoughts govern the intellectual part. By classification, there are 9 kinds of emotions- love, laughter, fury, mercy, horror, amazement, heroism, disgust, peace. This article deals with only two emotions, happiness and sadness. Happiness is a blend of laughter, love and amazement; while sadness is a blend of fury, mercy and horror. Although, the other three could be slightly related, let us not include them now.Let us assume that emotions are merely energies emitted by the mind. We know that energy is conserved in the entire universe. If a body loses heat, its surroundings (or another body) must gain heat. If a body gets charged, its surroundings (or another body) must get oppositely charged. This means to say that the universe enables an energy compensating mechanism which acts on an individual body, and not a collective of such bodies. In other words, the compensation is atomistic, rather than holistic.However, a body cannot continue to gain energy till eternity. The energy absorption has to be curbed in order to balance the total net energy of the collection of bodies. This is why; any body which absorbs energy eventually has to emit it. The reason for this will be explained in the later parts of the article. In order to model equations pertaining to emotions, some assumptions have been made; happiness is considered to be a positive mental energy, and sadness is considered to be a negative mental energy. Let as also assume that there exists an equilibrium mental energy- that accounts for peace and "emotionless" phase. This might be regarded as zero by convention, however, let us take it to be E_{M0}. And E_{M0}, a human has no urge to do anything, nor gets affected by anything. Transitions from one emotional phase to another happen in so many kinds- Copycat Effect, Cumulative Compensation, Peak Compensation etc. But, we would be discussing only on Copycat Effect.

Copycat Effect

When it comes to mental energies, we consider that Happiness and Sadness are mutually interactive phases. If so, then they must follow the Copycat effect. The Copycat Effect is that effect when the magnitude of happiness/sadness to be caused is equal to the magnitude of sadness/happiness already caused. This doesn't mean that the energy absorbed during happiness and evolved during sadness are equal, unless the equilibrium energy E_{M0} is zero. Let the happiness/sadness that has been caused be, E_M. Let the sadness/happiness to be caused to compensate E_M be, E_M'.

$$E_M = -E_M'$$
$$E_M - E_{M0} = \Delta E_M = E_{M0} - E_M'$$

E_M' pays off the impact created by E_M. ΔE_M is the change in mental energy due to the first impact or the second (compensating) impact. In Copycat Effect, ΔE_M remains constant for a set. E_{M0} is the equilibrium energy in "emotionless" phase. Although, it is regarded as 0, conventionally, as mentioned above, the term E_{M0} seems more precise than 0.

Mathematical form of mental energies

In thermodynamics, $heat\ energy = \varphi(entropy)$

- ⇨ $dQ = T.dS$
- ⇨ $change\ in\ total\ energy = (intrinsic\ property).(change\ in\ assembly)$

Similarly,

$$dE_M = (intrinsic property).dS$$

In mental energies, the intrinsic property, or rather "intrinsic" property (implying that the property is not purely intrinsic), is considered to be an abstract physical quantity- Consciousness (Γ).

$$dE_M = \Gamma.dS$$

But, the change in entropy is a rather vague term. To a primitive understanding, we could say that, emotional distractions are caused due to change in entropy. As perfect and logical as it seems, the term is supposed to have a lot of inner meanings.
Consider a purely emotionless phase. If there are no emotions whatsoever, there could be no change in the energy. Hence, $dE_M = 0$.

Case I:

Let $dS = 0$
This implies that change in mental states/thought processes is nil; which implies that the person is made to or is intrinsically focusing on only one entity without any distraction. This means that the person must be a 'perfect' sage or a robot.

Case II:

Let Γ=0
This means that the person has no consciousness; that is, the person is either unconscious or dead.

Interaction of Mental Energies between an Individual and the Rest

Consider a peer group undergoing a problem. Each individual in the peer undergoes the same problem. Each of them is unhappy about the problem. If one of them turns really upset, the rest try cheering the one, which elevates the total mental energy (by reducing the sad energy) to more than normal. Energy of the universe (U) is a constant. It is the sum of all the physical and mental energies in the universe. Let there be n species emitting/absorbing mental energies. Since the sum of all the physical energies of the universe is constant, the sum of all mental energies is also constant.

$$U = U_P + U_M$$
$$U_M = nE_{M0}$$

If one gets happy/sad, then

$$U_M^{'} = (n-1)E_{M0} + E_M$$

Here, U_M' is the new momentary Energy of the universe due to one's happiness/sadness.

$$U_M^{'} = nE_{M0} + E_M - E_{M0}$$
$$U_M^{'} = nE_{M0} + \Delta E_M$$

Since U_M is always constant. U_M' must be compensated to bring it back to U_M. Therefore, the compensating term required to neutralize U_M' to U_M is of magnitude $-\Delta E_M$.

$$U_M = nE_{M0} + \Delta E_M - \Delta E_M$$

Since $\Delta E_M = E_{M0} - E_M^{'} = E_M - E_{M0}$,

$$U_M = nE_{M0} + \Delta E_M + E_M^{'} - E_{M0}$$
$$= (n-2)E_{M0} + E_M + E_M^{'}$$

... $[E_M + E_M^{'} = 2E_{M0}$; as, $E_M - E_{M0} = E_{M0} - E_M^{'}]$

This means that, if one becomes happy, simultaneously another becomes sad, and vice versa.

$$U_M = (n-2)E_{M0} + (1).E_M + (x).\frac{E_M^{'}}{x}$$
$$x \rightarrow variable\, number\, of\, people$$
$$\frac{E_M^{'}}{x} \rightarrow stabilizing\, sadness\, or\, happiness\, each\, undergoes.$$

This implies that, in this whole world, if you become happy, then there is someone/group of people who are sad because of your happiness. A similar case applies to your sadness as well.