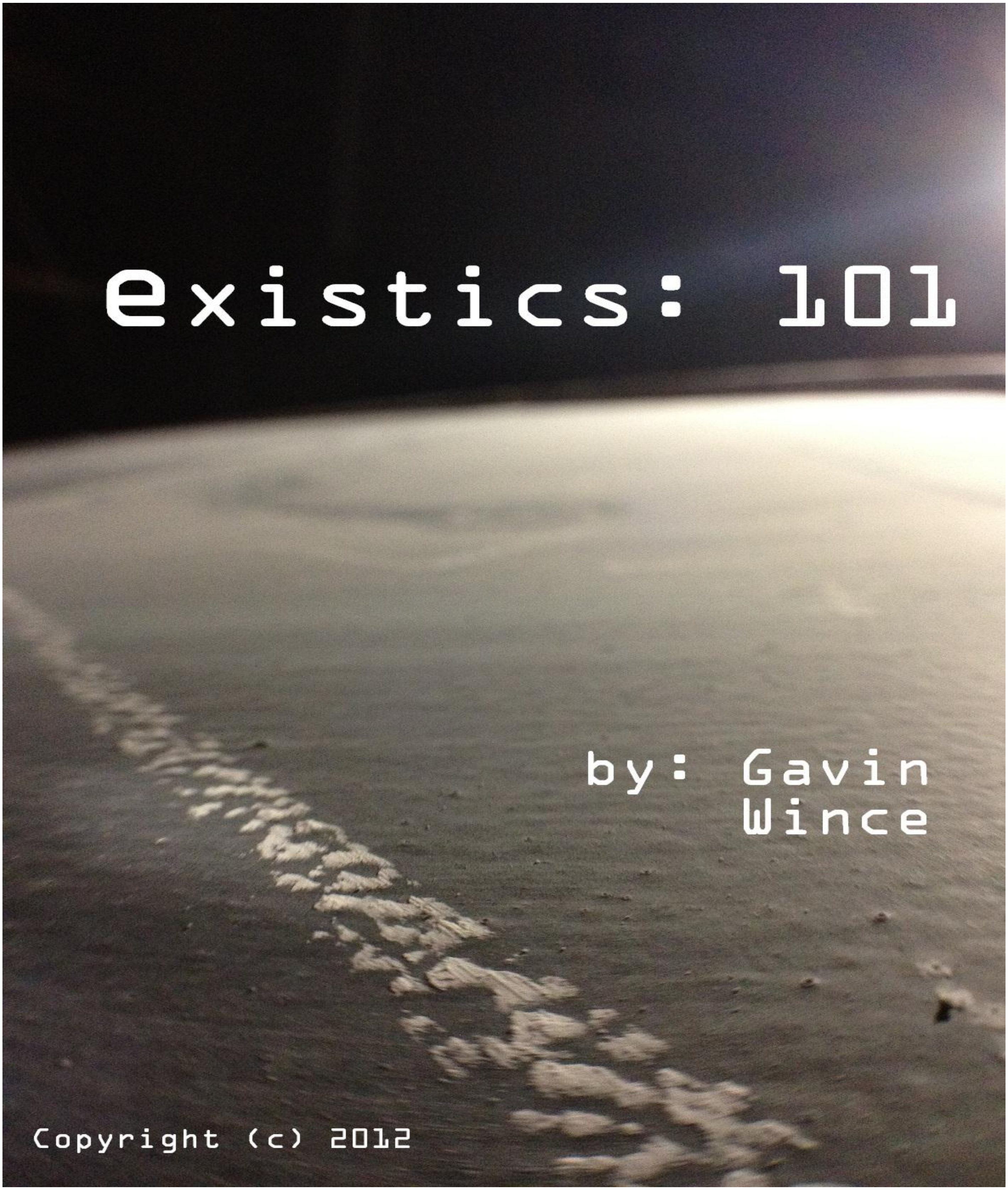
existics: 101
by: Gavin
Wince
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Friday, the 13th of January, 2012

"Existics is neither the name of a book nor the name of any specific dogma, doctrine or ontology. Existics is intended and designed to be independent of bias or opinion; an open subject employed to change through the refinement of its terms. Therefore, in its own right, Existics is the study of the laws that govern existence."- Gavin Wince

I. Introduction

If one studies everything that one possibly can, and then goes on even further to search for common patterns in areas most unexpected, one will find that there is an invisible, inexpressible fundamental truth that, from which, all other things extend. This truth is so universal and so fine in nature, that it evades most worldviews, even though it is always directly in contact with us. It is within us and all about us. It is us, yet it is not us either. It is independent of having any extension having no manifest form or instantiated representation. However, its paradoxical behavior, which is eternally present and persistently evading rhetorical and sensual encapsulation, is the very means of measure through which the axioms of Existics are founded upon. This is an attempt to formalize that which has been considered unable to be formalized: the relationship between the self and the other-than-self. Existics is a formalization designed around observation, logic and mathematics dealing with the ultimate questions about existence; a study of the basic laws of existence.

II. Preface

That, from whence all things come from and therefore must again return to, is neither existent nor nonexistent. For it to exist, it would have to have extension from some initial source. *'To be'* is not initial, rather *'to be'* is having had been initiated. Therefore *'it'* does not exist. But what is *'it'* then that I am referring to as *'that'* which does not exist? If I Can refer to something, then that something must have some kind of existence such that it can be referred to. Therefore, '*it'* does not exist, nor does *'it'* not exist either. How can this be? "It is!" Then what is it? Simple: "it is the source that from which all things extend." Even though this thing that I am referring to is inexplicable, we will assume that it is that from which existence arises.

However, one must not fall into the immediate trap of assuming that this thing is distinctly separate from existence. In fact, it is existence, but we are cursed with a flawed language, indirect contact through sensory input; a skewed view through emotions, superstition, and lack of desire for whole understanding. We have a veil of ignorance glazed over our every faculty preventing us from being able to encounter it or refer to it directly independent of a dualistic construct or a variety of expressions through a multiplicity of forms.

So from the get go we are absolutely wrong in our every description of existence. We are trapped and stumble upon that very thing; having to proceed forward in counter intuitive and paradoxical terms. We are at the least pompously arrogant to assert that we could successfully finish such a task; as to claim such *'knowledge'* is the greatest decree of stupidity. Consequently, in order to describe something that cannot be described we must describe it anyway knowing that it is not the object of our description and that we must proceed with the utmost caution and <u>humility</u>.

III. Postulates of Existics

1). Existence is.

A). Something exists.

i). Something is not nothing.

ii). Something is not everything.

iii). Something is one or more things.

B). For something to exist, it must be in an interaction with some other thing that exists.

i). There are at least two things.

ii). No two things are exactly the same.

iii). No two things are totally different.

iv). No two things are perfectly complementary.

2). Existence is both physical and nonphysical.

A). Something is both physical and nonphysical.

i). No thing is completely physical.

ii). No thing is completely nonphysical.

iii). No two things have the exact same proportion of

physicality to nonphysicality.

iv). No two things have the exact inverse proportions of physicality to nonphysicality.

B). Both ‘the physical’ and ‘the nonphysical’, infinitely, are gradient blends of the ‘physical’ and the ‘nonphysical’, where one is becoming more of the other.

i). The ‘physical’ and ‘nonphysical’ can never completely blend into one.

ii). The ‘physical’ and the ‘nonphysical’ can never completely separate or be completely distinguishable.

iii). The ‘nonphysical’ forms (manifests); the ‘physical’ is formed (manifested).

iv). The ‘nonphysical’ animates; the ‘physical’ is animated.

3). Existence is experienced through objective and subjective frames of reference.

A). The objective frame of reference is of the physical.

i). No thing physical is experienced subjectively.

ii). Existence is the objective link to the subjective.

B). The subjective frame of reference is of the nonphysical.

i). No thing nonphysical is experienced objectively.

ii). Experience is the subjective link to the objective.

4). Experience is the relationship between observation and existence.

A). Animate (observer) objects:

i). Experience physical existence through objective frames of reference.

ii). Experience nonphysical existence through subjective frames of reference.

B). Inanimate (observed) objects:

i). Physically exist as observed objects.

ii). Nonphysically exist as observed forms.

C). All things that exist have and exist within both subjective and objective frames of reference.

i). If something has subjective experience, it must have objective (physical) existence.

ii). If something is objectively experienced, it must have subjective (nonphysical) existence.

5). Observation is the relationship between the observer and that, which is being observed.

A). Something is subjectively observant of something else being objectively observed.

i). Something is not observant of nothing.

ii). Something is not observant of everything.

B). Observation is experienced through subjective and objective frames of reference and exists through physical/nonphysical interactions.

i). For something to be in observation, it must have both subjective and objective frames of reference.

ii). For subjective and objective frames of reference to exist, there

must be an observer and something to be observed.

IV. Axiomatization of the Postulates of Existics

Let **1)**

If **1)**, then **1)A)**

Let **1)A)** = **1)A) {i, ii, iii}**

Let **1)B)**

If **1)B)**, then **1)B) {i}**

Let **1)B) {i}** = **1)B) {ii, iii, iv}**

Let **2)**

If **1)A)** and **2)**, then **2)A)**

If **1)A) {ii}**, then **2)A) {i}**

If **1)A) {i}**, then **2)A) {ii}**

If **2)A) {i, ii}**, and if **1)B) {iii, iv}**, then **2)A) {iii, iv}**

Let **3)**

If **3)A) {i, ii}**, then **3)B) {i, ii}**

If **3)B) {i, ii}**, then **3)A) {i, ii}**

Let **4)**

If **4)A) {i}**, then **4)A) {ii}**

Let **4)B) {i, ii}**

If **([3)A) {i, ii}** and **3)B) {i, ii}]** and

[if **4)A) {i}**, then **4)A) {ii}])**, then **4)C) {i, ii}**

Let **5)**

If **[**all of **1)**, all of **2)**, all of **3)**, all of **4)]**, then **5)A)** and **5)B)**.

Let **5)A)** = **5)A) {i, ii}**

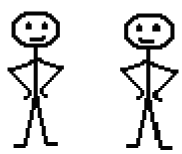
Let **5)B)** = **5)B) {i, ii}**

Discussion: This basic axiomitization of these proposed postulates of Existics is to illustrate how these postulates follow fundamental rules of logic, such as Truth-Function Rules, Modal Rules, or Quantificational Rules, using very specific assumptions. A more thorough treatment of these postulates, using conventional forms of Logic, is the subject of a Logic essay and not necessary for the basic understanding of Existics. These *'axioms'* are here, to be established as rules, for the benefit of reference when deriving the Existics equations from the proposed postulates. Notwithstanding, Existics has five assumptions from which the treatment of Relative Frames of Reference, the Reference Frame Schemata, and the concept of Invariance through Identity are derived; all of which becomes expressible through arithmetic.

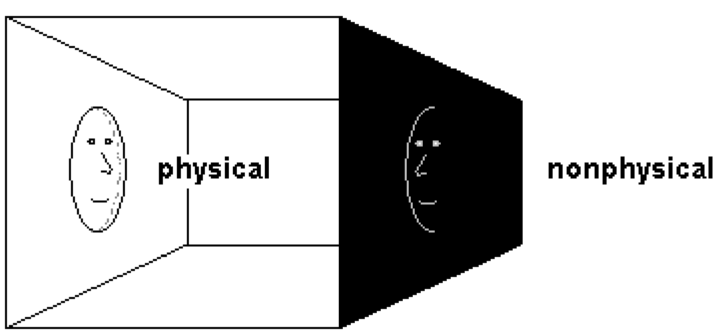
V. Interaction: Basis for Existence

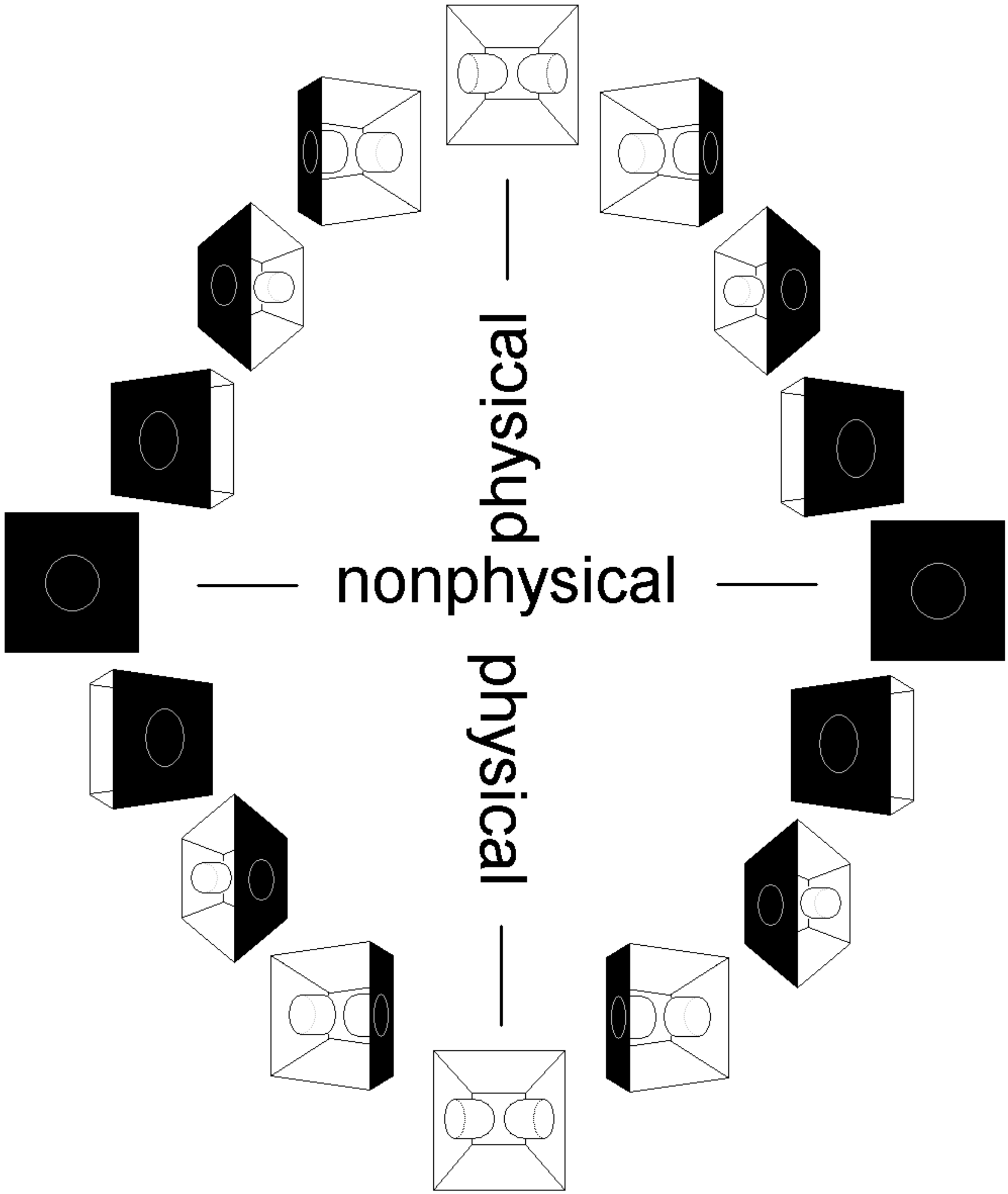
a. Relative Frames of Reference

Let us examine how the rules of Existics apply to an interaction between two different subjects. Let them be two people: person **A** and person **B**.

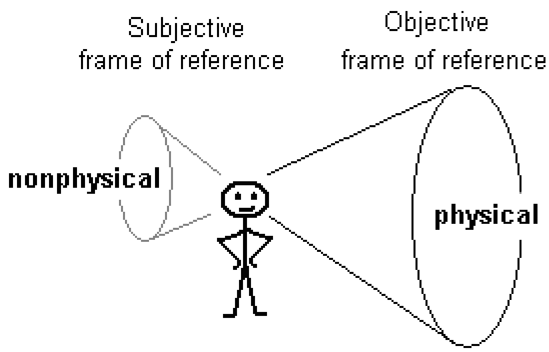


Each person exists in two categories of reference frames: physical and nonphysical, or objective and subjective. You can imagine the objective or physical frame of reference as being something with extension and/or volume in space/time that contains all of the objects of our sensory experience. You can imagine the subjective or nonphysical frame of reference as an inwardly open expanse where things of mental and/or instinctual effect take place.




physical
nonphysical
physical

The objective frame of reference extends outwardly away from the senses of the individual, and the subjective frame of reference extends inwardly away from the senses of the individual. The individual is composed of both physical and nonphysical attributes which arise in their respective frames of reference.

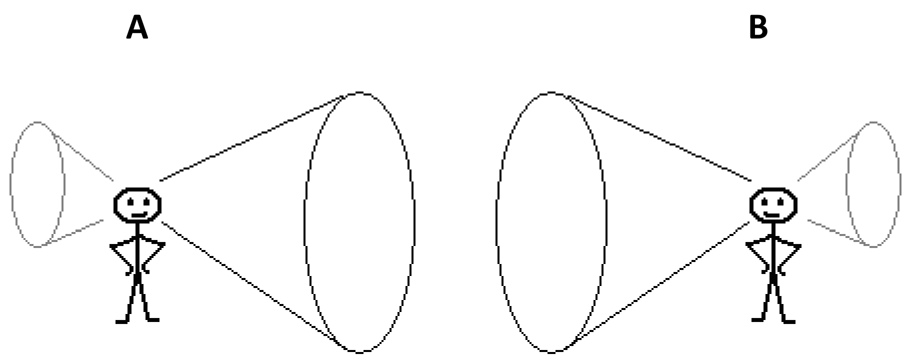


The individual exists physically in their respective objective frame of reference, and the individual exists nonphysically in their respective subjective frame of reference. Something observed in the objective frame of reference is not the same thing as that experienced in the subjective frame of reference relative to that thing observed objectively, as ‘seeing’ a flame is not equivalent to ‘feeling’ its heat.

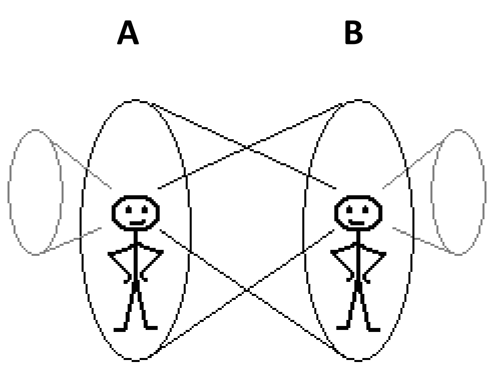
The objective frame of reference, relative to one thing, is not the same objective frame of reference relative to some other thing, such as two different perspectives yielding two different observations. Also, some observer’s objective reference of some object is not equivalent to that object in any other frame of reference. In other word, the objective frame of reference of person **A** is different from the objective frame of reference of person **B**. It would follow that the subjective frame of reference of person **A** is different from the subjective frame of reference of person **B**.

When two individuals observe some third party, let us say some person **C**, there is a “person **C**” relative to **A**, a “person **C**” relative to **B**, and a “person **C**” relative to itself. This holds true for any given number of things, unless they are in fact the same thing.

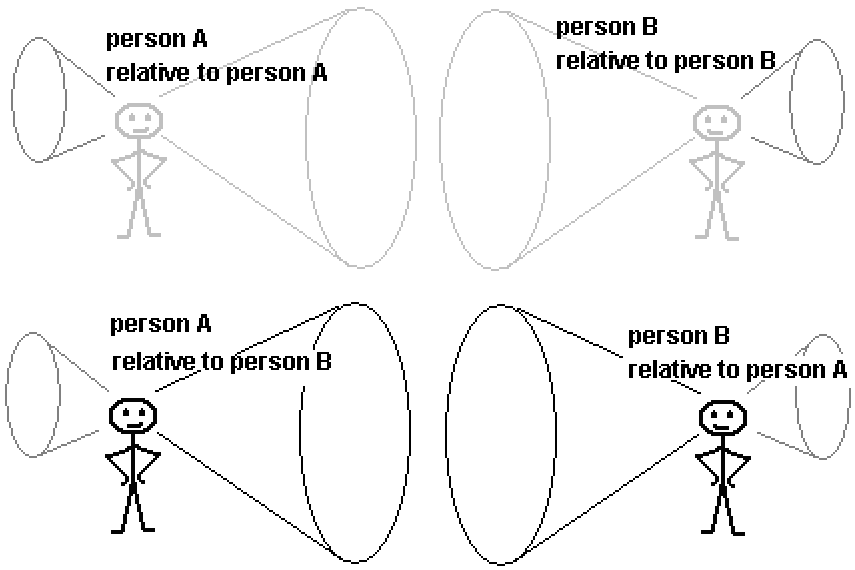
A and **B** in observation of one another:



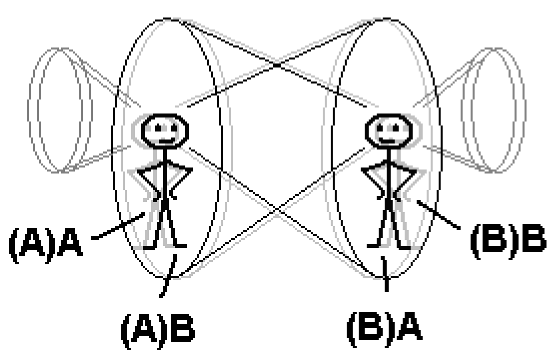
The entanglement of **A** and **B** in an event:



Since person **A** and person **B** exist in different frames of reference relative to one other, person **A** and person **B** exist in relative frame of reference. So, there is a person **A** relative to person **A**, a person **A** relative to a person **B**, a person **B** relative to person **B**, and a person **B** relative to person **A**.



There is a subjective and objective frame of reference for person **A** relative to person **A**, there is a subjective and objective frame of reference for person **A** relative to person **B**, there is a subjective and objective frame of reference for person **B** relative to person **B**, there is a subjective and objective frame of reference for person **B** relative to person **A**.



$(A)A \neq (A)B \qquad (B)B \neq (B)A$

We will use a simplified notation to represent the following: person **A** relative to person **A** is **(A)A** or "**A** relative to **A**", person **A** relative to person **B** is **(A)B** or "**A** relative to **B**", person **B** relative to person **B** is **(B)B** or "**B** relative to **B**", and person **B** relative to person **A** is **(B)A** or "**B** relative to **A**".

b. Reference Frame Schemata

We can therefore define person **A** and person **B** in terms of relative frames of reference pertaining to person **A** and person **B**.

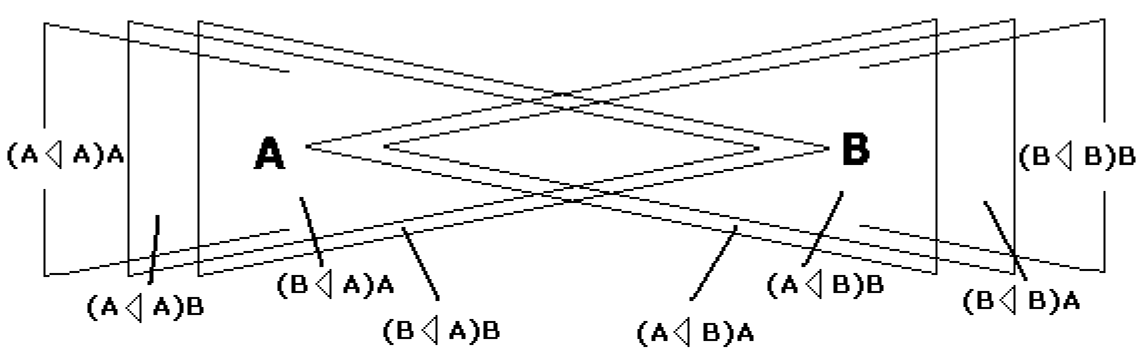
A can be defined as **(A)A**, and **(A)B**. **(A)A** and **(A)B** can be broken down further into subjective and objective frames of reference such as
(A◁A)A, **(B◁A)A**, **(A◁A)B**, and **(B◁A)B**.

(A◁A)A = A's subjective reference of A relative to A
(A◁A)B = A's subjective reference of A relative to B
(A◁B)A = A's objective reference of B relative to A
(A◁B)B = A's objective reference of B relative to B

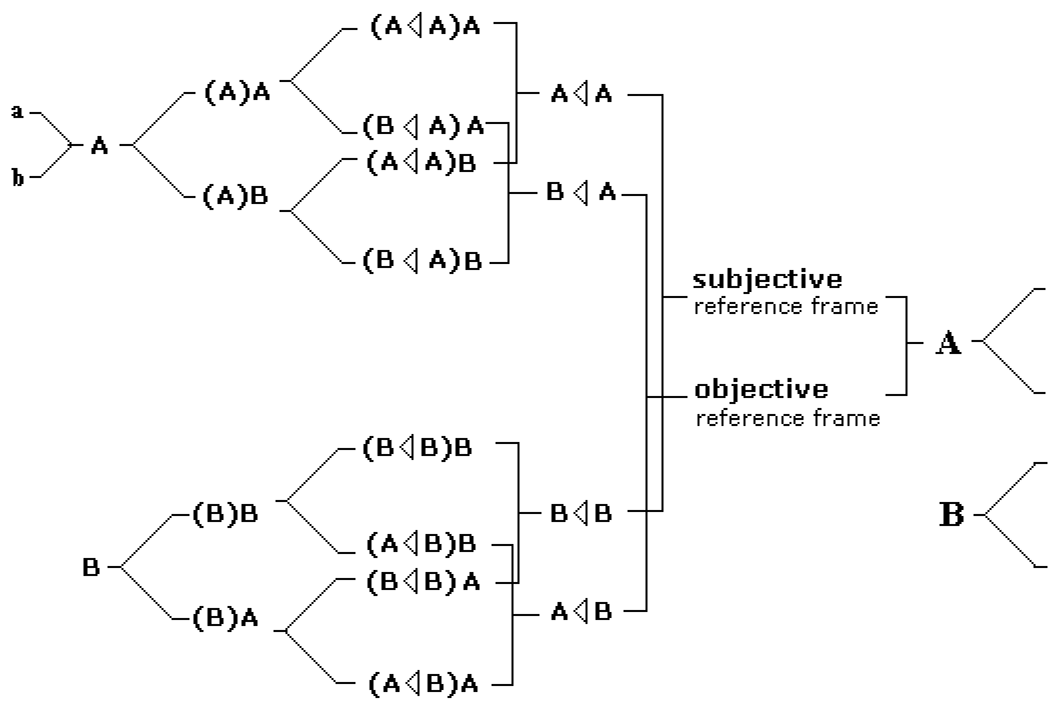
(B◁B)B = B's subjective reference of B relative to B
(B◁B)A = B's subjective reference of B relative to A
(B◁A)B = B's objective reference of A relative to A
(B◁A)A = B's objective reference of A relative to B

In order to completely define **A**, we must define **B**.

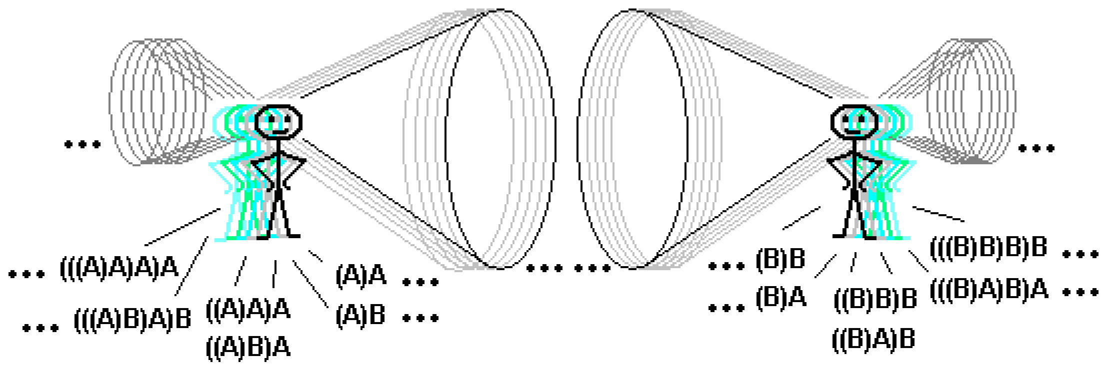
B can be defined as **(B)B** and **(B)A**. **(A)A** and **(A)B** can be broken down further in subjective and objective frames of reference such as
(B◁B)B, **(A◁B)B**, **(B◁B)A**, and **(A◁B)A**.



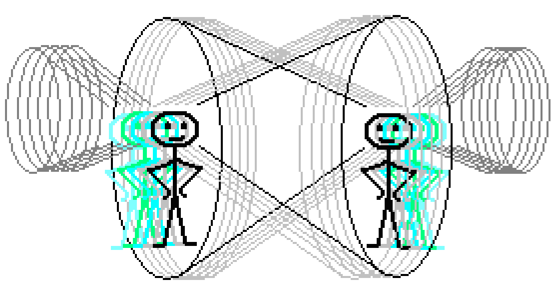
The objective and subjective frames of reference between **A** and **B** can be seen collectively as a greater subjective and objective frame of reference making a larger collective object between **A** and **B**, namely **A**. Since it is the case that for one object to exist, it must be in an interaction with some other object, there must be some other greater object **B** in relation to **A**. It would also follow that the initial **A** and **B** are composed of sub-units of subjective and objective frames of reference that belong to some lesser object **a** and some lesser object **b**.



Therefore, the relative frames of reference extend into greater and greater and lesser and lesser relative frames of reference. Not only are there relative frames of reference, but there are relative-relative frames of reference, relative frames of reference existing as subset frames of reference; all existing within greater and greater sets, ad infinitum.



Since there are relative frames of reference between **A** and **B**, there are infinite sequences of reference frames relative to **A** and **B**. These are series of relative frame of reference such as **(((A)B)A)B...,** or **((((A)B)A)B)A...**, or **(((((B)A)B)A)B)A...**, etc. The series of relative frames of reference that concern us are of the type where each relative frame of reference alternates between observants such as the example just given.



c. Invariance through Identity

The interaction between **A** and **B** can be broken down, described, and formalized as being sequences of interactions between physical and nonphysical attributes of **A** and **B** in a one to one correspondence through an infinite series of subjective and objective relative frames of reference. Referring back to the Postulates of Existics, specifically **1)B)**- for something to exist it must be in an interaction with some other thing that exists, it follows that **i)** there are at least two things, and **ii)** no two things are exactly the same, et seq.

A **B**

Assume we have two people engaged in some kind of interaction. Since they are not the same individual, there must be some type of quantifiable differences between the two individuals that can be used to measure relative frames of reference. From our perspective, we are all composed of the same stuff, do about the same thing, and all travel at about the same relativistic speeds all within about the same given area. So, there really is no observable variance in relative frames of reference between two observers outside phenomena concerning Special and General Relativity; or is there?

Let us take this into consideration: suppose we assume that observers can experience different rates of the passage of time, relative to one another, outside phenomena concerning Special and General Relativity. For instance, people report that as they get older the experienced rate of the passage of time increases exponentially. Therefore, this could be used as an analogy to figure out how to calculate the alleged variance in the experience of the passage time between two observers experiencing the same non-relativistic event. Indeed, many people will argue that yes, it would seem, time goes by faster as we age. We can recall when we were children, days, weeks, months seemed to last forever; memories left as little road markers at times in our life where we can distinctly see how the experience of the rate of the passage of time appears to increase with age. Therefore, using this analogy to establish a formal mathematics, let us also assume that, at an initial point of an observer's existence, the experienced rate of the passage of time is at a stand-still, and, at a hypothetical point of infinite age, the experienced rate of the passage of time is instantaneous. As the limit approaches infinity from zero, as the observer's age starts at zero and ends with infinity, the experienced rate of the passage of time increases exponentially.

We will assume that for older people, the experienced rate of the passage of time is noticeably faster than the experienced rate of the passage of time as perceived by younger people. Assuming this to be the case, we must take notice of a funny little predicament: when and older and younger person are engaged in an interaction of some kind, the older person is experiencing that event at a faster rate (passage of time) that the younger person; which creates a conundrum--- What is occurring with *'time'* between the two people? It would be easy to scoff this off and say that when two people come together, regardless of the experienced rate of the passage of time, time passes at the same rate regardless and that it is just a subjective perception that time goes by faster with age. This seemingly pragmatic point-of-view has an assumption buried within it: what we as individuals experience objectively, is the same for all other individuals objectively, and that we all exist within and share a common objective reality. At first glance, this assumption seems tame and common sense. However, I will point out its fatal flaw: all empirical data we receive comes to us via the senses. Therefore, fundamentally, even though it may seem funny to assume we each live in different fields of existence relative to time in relation one another, the fact of the matter is we do! This is an inescapable reality that prevents us from any certainty outside the '*belief'* that there is a common objective reality. Since we are limited to the use of senses, our entire experience of physical reality could be an illusion for all we know. Therefore, we are justified in continuing along the path of reasoning we have gone thus so far.

It can be deduced that since the older person experiences time at a faster rate, that person is further ahead in time relative to their own experience of the event relative to the younger person, and the younger person is further behind in time relative to the experience of the event relative to the older person. This means that the older person is in the relative future, and the younger person is in the relative past; relative to each other. Assuming this to be the case, it means that there is at least one extra dimension of time. This all fits perfectly within the framework we have already laid out.

Indeed, when the older person, say person **A**, experiences a particular moment, the younger person, say person **B**, will come to experience it at a latter time. The ratio of **A/B** tell us how many units of time relative to **A** equal one unit of time relative to **B**. The ratio **B/A** tells us how many units of time relative to **B** equal one unit of time relative to **A**.   If **A** and **B** are equivalent, then the ratio between **A** and **B** equal one. Thus, we will amend postulate **1)B) {ii}** to state that "No two things are exactly the same, but if they are, then they are in fact the same thing." We will let the expression **A/B** = **I**, where **I** is the Identity Constant. When the Identity Constant equal one, the expression **A/B** = 1, where **A** and **B** are equivalent. If the Identity Constant relative to **A** is greater than one, **A/B** > 1, and the Identity Constant relative to **B** is less than one, **B/A** < 1, then **A** is greater than **B** and **B** is less than **A**.

VI. Existics Equations (Basic)

Where **N** is the number of units of time **A** experiences relative to one unit of time for **B**, and **U** is the number of units of time **B** experiences relative to one unit of time for **A**.   If **A** and **B** are the same age, and therefore experience the passage of time at the same rate, the **N** and **U** would both equal 1.

$$\frac{A}{B} = N \qquad \frac{B}{A} = U \qquad U \cdot N = 1$$

However, within our framework, there are an infinite number of relative frames of reference, so we shall account for this in the following way: relative to **A**, there is a **B**, relative to that **B** there is another **A**, and relative to that **A** there is another **B;** ad infinitum. The same can be said for **B**.

We can interpret this as a slight shift more into the future for **A**, and a slight shift more into the past for **B**. Using the ratios **A/B** and **B/A** to find the invariance between the infinite relative frames of reference between **A** and **B**, we will expand the ratios **A/B** and **B/A** into the following continued fractions:

"**(A)B)A)B)A)B)…"** arithmetically represented as "**A** over **B**, relative to **A**, over **B**, relative to **A**, over **B**, etc."

$$\frac{A + N'}{B} = \cfrac{A + \cfrac{A + \cfrac{A + \cfrac{A + \cdots}{B}}{B}}{B}}{B}$$

"**(B)A)B)A)B)A)…"** arithmetically represented as "**B** over **A**, relative to **B**, over **A**, relative to **B**, over **A**, etc."

$$\frac{B - U'}{A} = \cfrac{B - \cfrac{B - \cfrac{B - \cfrac{B - \cdots}{A}}{A}}{A}}{A}$$

N' is the extension given to **A**, and **U'** is the retraction take from **B**. Taking infinite relative frames of reference into account, we will let the continued fraction relative to **A** equal some number **N***, and we will let the continued fraction relative to **B** equal some number **U***. As the continued fraction is expanded infinitely, we will let **N'** approach **N*** and **U'** approach **U***.

At the limit, or when the fraction has been carried out infinitely;

N' = N*, and **U' = U*.**

Let N' approach N*

$$\frac{A + N'}{B} = N^*$$

$$\frac{A + N^*}{B} = N^*$$

$$A + N^* = N^* \cdot B$$

$$A = N^* \cdot B - N^*$$

$$A = N^* (B - 1)$$

$$\frac{A}{B - 1} = N^*$$

Let U' approach U*

$$\frac{B - U'}{A} = U^*$$

$$\frac{B - U^*}{A} = U^*$$

$$B - U^* = U^* \cdot A$$

$$B = U^* \cdot A + U^*$$

$$B = U^* (A + 1)$$

$$\frac{B}{A + 1} = U^*$$

(where **B** >1)

We now have **N*** and **U*** which accounts for infinite relative frames of reference between two individuals engaged in some kind of interaction. Since **N*** and **U*** do not multiply to equal 1, we will let their sum equal some number **I**, the Identity Constant, which almost equals 1. If **A** and **B** experienced the same rate of the passage of time, the **N*** would equal **N** which would equal 1, and **U*** would equal U which would equal 1. In this case, the Identity Constant is one: **I** = 1. When **A** and **B** have the same identity, or experience the same rate of the passage of time, they are one and the same individual. Therefore **I**, the identity constant, quantifies the variance in rate between two different individuals separate experiences of the passage of time from that of two individuals experiencing the passage of time at the same rate.

$$U^* \cdot N^* = I \qquad I \geq 1 \text{ When } A \geq B$$

In order to construct an equation that allows us to calculate where in time **A** and **B** exist in relative to one another, we must take notice of the following: whenever we divide a larger number by a smaller number, and the numbers are relatively close in value, we get some number close in value to 1; like 1.347, 1.216, etc. We know that two people close to the same age, i.e. experiencing nearly the same rate of the passage of time, would have ratios like 100/99 = **N** and 99/100 = **U**. The closer the experience in the passage of time, the closer **N** and **U** go towards being some fraction away from one.

For these reasons, we must subtract away from **N** a number close to 1 in order to add some number to **A** to get the value **A*** representing where in the future **A** is relative to **B**. Likewise, we must subtract **U** away from a number close to 1 in order to subtract some number from **B** to get the value **B*** representing where **B** is in the past relative to **A**.

However, we are working with infinite relative frames of reference between **A** and **B**, so we must use **N***, **U***, and **I** rather than **N**, **U**, and 1.

$$A^* = A + (N^* - I)$$

$$B^* = B - (I - U^*)$$

When **A** comes to experience some particular moment during some given event, **B** is in the past **(B*)** relative to **A**. When **B** come to experience that particular moment during the same given event, **A** is in the future **(A*)** relative to **B**.

<u>Example</u>:
Suppose we have two people: person **A**, who is 100 years old; and person **B**, who is 20 years old.

A = 100 **B** =20

From this we obtain:

$$\frac{A}{B} = \frac{100}{20} = N = 5 \qquad \frac{B}{A} = \frac{20}{100} = U = 0.2$$

$$5 \cdot 0.2 = U \cdot N = 1$$

$$\frac{A}{B-1} = \frac{100}{20-1} = N^{*} = 5.2632 \qquad \frac{B}{A+1} = \frac{20}{100+1} = U^{*} = 0.1980$$

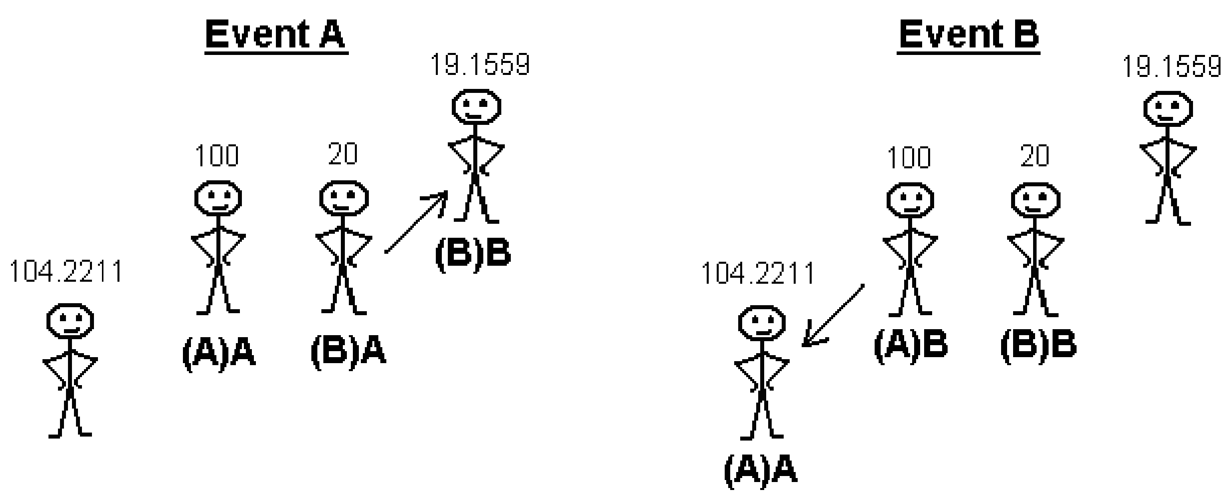
$$0.1980 \cdot 5.2632 = U^{*} \cdot N^{*} = I$$

$$A^{*} = A + (N^{*} - I) \qquad B^{*} = B - (I - U^{*})$$

$$A^{*} = 100 + (5.2632 - 1.0421) \qquad B^{*} = 20 - (1.0421 - 0.1980)$$

$$A^{*} = 104.2211 \qquad B^{*} = 19.1559$$

At the event relative to **A**, **(A)A** is 100 units of age, **(B)A** is 20 units of age, and **(B)B** is 19.1559 units of age. As **(B)B** progresses towards being 20 units of age, and **(A)B** is 100 units of age, **(A)A** progresses towards being 104.2211 units of age. Once **(B)B** is 20 units of age and progresses towards 20.1980 units of age, **(A)A** progresses towards 105.2632 units of age.



19.1559 = **(B)A** 100 = **(A)A** 20 = **(B)B**

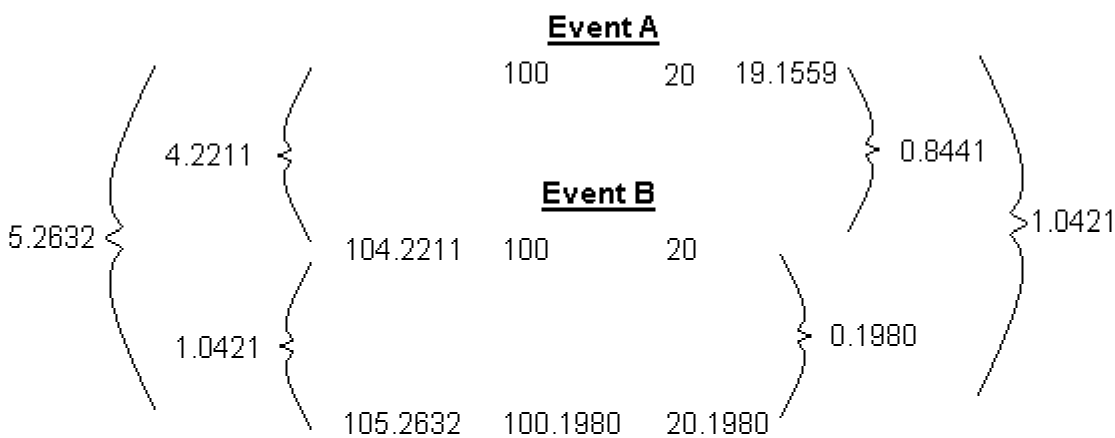
100 = **(A)A** 20 = **(B)B** 104.2211 = **(A)B**

B = (B)A **A = (A)B** **B = (B)B**

A = (A)A **B* = (B)B** **A* = (A)A**

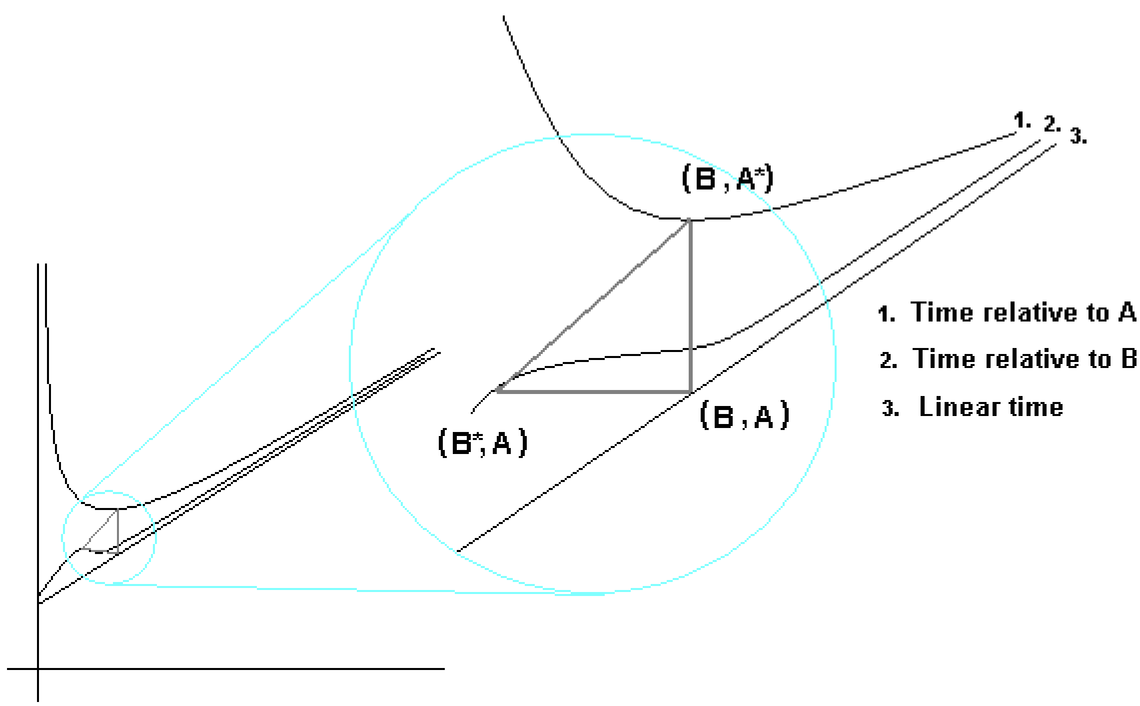
Therefore, we can deduce from the preceding equations the following information:

Approximately 1 unit of time relative to person **B** equals 5.2632 units of time relative to person **A**. Approximately 1 unit of time relative to person **A** equals 0.1980 units of time relative to person **B**. At the instantaneous superposition of both events (relative to **A** and relative to **B**) **(A)A** is 4.2211 units of time ahead, and **(B)B** is 0.8441 units of time behind.



If we graph this information, designating **A** as the y-coordinate and **B** as the x-coordinate, we find that there are two curves and a line. The single line with a slope **A**/**B** represents linear time. Time relative to **A** is represented by the hyperbolic curve extending down from (0,∞), reaching a minimum, and then extending asymptotically back up towards the linear time line in a positive direction. Time relative to **B** is represented by the curve extending off of the y-axis at some finite point, making a slightly tilted bell-curve, and then progressing asymptotically towards the linear time line in a positive direction. All three time lines (curves) converge at infinity.

Note: When **B** is approximately at the midpoint along the bell-curve, and **A** is approximately at the minimum point, **A/B** approximately equals 2, and **B/A** approximately equals 1/2. When **A** is roughly twice the age of **B**, and **B** is roughly half the age of **A**, **A*** passes through a point with the least relativistic age with the most distance away from linear time, and **B*** reaches it maximum point away from linear time.



In other words, **A** and **B** begin to converge towards having the same age, and experiencing the same rate of the passage of time. The interesting bulge in the curve of **B** has to do with the transformation for **A***. There is a center of time frame of reference, namely when **A** and **B** interact in linear time. **A** and **B** extend away from linear time along their respective curves towards the minimum number of intermediary states, and towards the maximum amount of time variance (see intermediary frames of reference).

Examine the equation:

$$\frac{\mathbf{A}}{\mathbf{B} - 1} = \mathbf{N}^*$$

Notice that **B** must be greater than 1. Surely these equations must be able to account for variance in relative time using figures like 0.75, or 0.001 . How is this issue to be dealt with?

Multiply **A** and **B** by some common number, that is the minimum value great enough so that (**B** -1)>0.

$$\frac{\mathbf{A}}{\mathbf{B}} \cdot \frac{n}{n}$$

Then when equations have been solved for **A*** and **B***, you can then factor and return the values to the original units.

$$\frac{\mathbf{A}}{\mathbf{B}^*} \div \frac{n}{n} \qquad \frac{\mathbf{A}^*}{\mathbf{B}} \div \frac{n}{n}$$

This solution could also be used for ratios that are so large, the difference between **A** and **B** is too great to calculate **A*** and **B*** without some alteration to the equations.

However, it can be imagined very quickly that there could exist ratios so large or small that the common factor trick no longer works as a good tool for approximation. At this point a new concept must be introduced.

VII. Intermediary Frames of Reference

We can imagine **A** and **B** having extremely variant experiences of the rate of the passage of time and between **A** and **B** there exist others, such as **C, D, E, ...** etc., such that the experience of the rate of the passage of time relative to the others sequences between **A**'s and **B**'s variant rates. For instance, in terms of rate: **A>G>F>E>D>C>B**. The ratio between **A:G, G:F, F:E, E:D, D:C, C:B** are such that each of them is to its neighbor close enough to avoid anomalies in the equations. Before we answer the obvious question (what number of intermediaries?), let us first better define what is meant by intermediary frames of reference.

We are going to introduce a new notation to distinguish between using intermediaries and no intermediaries. Instead of using **A** and **B** for our two different subjects, we shall adopt the notation: a_0, a_1, a_2, a_3, a_4, ..., a_n. a_0 will represent the one experiencing the 'fastest rate' as the initial, and a_n will represent the one experiencing the 'slowest rate' as the final in a series or sequence of subjects, from initial (fastest) to final (slowest) where n-1 represent the number of intermediaries between a_0 and a_n. In other words, a_1, a_2, a_3, ..., are intermediary subjects between a_0 and a_n. Therefore, a_1 reference of a_0, relative to a_2 reference of a_1, relative to a_3 reference of a_2, relative to a_4 reference of a_3, etc., can be used to intermediate the variance in time between a_0 and a_n relative to a_n. Also, a_4 reference of a_n, relative to a_3 reference of a_4, relative to a_2 reference of a_3, relative to a_1 reference of a_2, etc. can be used to intermediate the variance in time between a_0 and a_n relative to a_0.

Example:

Let a_0 = 100,000, and let a_n = 2.1

We will use a_1, a_2, a_3, a_4 as intermediaries.

Let: $a_1 = 10{,}000$ $a_2 = 1000$ $a_3 = 100$ $a_4 = 10$

We must first find a_n relative to a_0, via the intermediaries a_1, a_2, a_3, a_4.

Find the following:

$$(a_1^*)\ a_0$$

$$((a_2^*)\ a_1^*)\ a_0$$

$$(((a_3^*)\ a_2^*)\ a_1^*)\ a_0$$

$$((((a_4^*)\ a_3^*)\ a_2^*)\ a_1^*)\ a_0$$

$$(((((a_n^*)\ a_4^*)\ a_3^*)\ a_2^*)\ a_1^*)\ a_0$$

$$(((((a_n^*)\ a_4^*)\ a_3^*)\ a_2^*)\ a_1^*)\ a_0 = [a_n^*]\ a_0$$

First:

$$\frac{a_0}{a_1 - 1} = N^* \qquad \frac{a_1}{a_0 + 1} = U^*$$

$$a_0^* = a_0 + (N^* - I)$$

$$(a_1^*)\ a_0 = a_1 - (I - U^*)$$

$$\frac{100{,}000}{10{,}000 - 1} = 10.001 \qquad \frac{10{,}000}{100{,}000 + 1} = 0.099$$

$$a_0^* = 100{,}009.902$$

$$(a_1^*)\ a_0 = 9999.109$$

Next:

$$\frac{(a_1^*)\ a_0}{a_2 - 1} = N^* \qquad \frac{a_2}{(a_1^*)\ a_0 + 1} = U^*$$

$$a_1^* = a_1 + (N^* - I\ )$$

$$((a_2^*)\ a_1^*)\ a_0 = a_2 - (\ I\ - U^*)$$

$$\frac{9999.109}{1000 - 1} = 10.009 \qquad \frac{1000}{9999.109 + 1} = 0.099$$

$$a_1^* = 10008.127$$

$$((a_2^*)\ a_1^*)\ a_0 = 999.108$$

Next:

$$\frac{((a_2^*)\ a_1^*)\ a_0}{a_3 - 1} = N^* \qquad \frac{a_3}{((a_2^*)\ a_1^*)\ a_0 + 1} = U^*$$

$$a_2^* = a_2 + (N^* - I\ )$$

$$(((a_3^*)\ a_2^*)\ a_1^*)\ a_0 = a_3 - (\ I\ - U^*)$$

$$\frac{999.108}{100 - 1} = 10.092 \qquad \frac{100}{999.108 + 1} = 0.099$$

$$a_2^* = 1008.201$$

$$(((a_3^*)\ a_2^*)\ a_1^*)\ a_0 = 99.1$$

Next:

$$\frac{(((a_3^*)\,a_2^*)\,a_1^*)\ a_0}{a_4 - 1} = N^* \qquad \frac{a_4}{(((a_3^*)\,a_2^*)\,a_1^*)\ a_0 + 1} = U^*$$

$$a_3^* = a_3 + (N^* - I)$$

$$((((a_4^*)\,a_3^*)\,a_2^*)\,a_1^*)\ a_0 = a_4 - (I - U^*)$$

$$\frac{99.1}{10 - 1} = 11.011 \qquad \frac{10}{99.1 + 1} = 0.099$$

$$a_3^* = 109.022$$

$$((((a_4^*)\,a_3^*)\,a_2^*)\,a_1^*)\ a_0 = 9.01$$

Finally:

$$\frac{((((a_4^*)\,a_3^*)\,a_2^*)\,a_1^*)\ a_0}{a_n - 1} = N^* \qquad \frac{a_n}{((((a_4^*)\,a_3^*)\,a_2^*)\,a_1^*)\ a_0 + 1} = U^*$$

$$a_4^* = a_4 + (N^* - I)$$

$$(((((a_n^*)\,a_4^*)\,a_3^*)\,a_2^*)\,a_1^*)\ a_0 = a_n - (I - U^*)$$

$$\frac{9.01}{2.1 - 1} = 8.191 \qquad \frac{2.1}{9.01 + 1} = 0.209$$

$$a_4^* = 15.489$$

$$(((((a_n^*)\,a_4^*)\,a_3^*)\,a_2^*)\,a_1^*)\ a_0 = 0.597$$

$$[a_n^*]\,a_0 = 0.597$$

We have solved for a_n relative to a_0, via the intermediaries a_1, a_2, a_3, a_4. Now we must solve for a_0 relative to a_n, via the intermediaries a_1, a_2, a_3, a_4.

Find the following:

$$(a_4^*)\ a_n$$
$$((a_3^*)\ a_4^*)\ a_n$$
$$(((a_2^*)\ a_3^*)\ a_4^*)\ a_n$$
$$((((a_1^*)\ a_2^*)\ a_3^*)\ a_4^*)\ a_n$$
$$(((((a_0^*)\ a_1^*)\ a_2^*)\ a_3^*)\ a_4^*)\ a_n$$

$$(((((a_0^*)\ a_1^*)\ a_2^*)\ a_3^*)\ a_4^*)\ a_n = [a_0^*]\ a_n$$

First:

$$\frac{a_n}{a_4 + 1} = U^* \qquad \frac{a_4}{a_n - 1} = N^*$$

$$(a_4^*)\ a_n = a_4 + (N^* - I)$$

$$a_n^* = a_n - (I - U^*)$$

$$\frac{2.1}{10 + 1} = 0.191 \qquad \frac{10}{2.1 - 1} = 9.091$$

$$(a_4^*)\ a_n = 0.555$$

$$a_n^* = 17.355$$

Next:

$$\frac{(a_4^*)\ a_n}{a_3 + 1} = U^* \qquad \frac{a_3}{(a_4^*)\ a_n - 1} = N^*$$

$$((a_3^*)\ a_4^*)\ a_n = a_3 + (N^* - I\ )$$

$$a_4^* = a_4 - (I\ - U^*)$$

$$\frac{17.355}{100 + 1} = 0.172 \qquad \frac{100}{17.355 - 1} = 6.114$$

$$((a_3^*)\ a_4^*)\ a_n = 105.062$$

$$a_4^* = 16.475$$

Next:

$$\frac{((a_3^*)\ a_4^*)\ a_n}{a_2 + 1} = U^* \qquad \frac{a_2}{((a_3^*)\ a_4^*)\ a_n - 1} = N^*$$

$$(((a_2^*)\ a_3^*)\ a_4^*)\ a_n = a_2 + (N^* - I\ )$$

$$a_3^* = a_3 - (I\ - U^*)$$

$$\frac{105.062}{1000 + 1} = 0.105 \qquad \frac{1000}{105.062 - 1} = 9.601$$

$$(((a_2^*)\ a_3^*)\ a_4^*)\ a_n = 1009.496$$

$$a_3^* = 104.159$$

Next:

$$\frac{(((\,a_2^*)\,a_3^*)\,a_4^*)\;a_n}{a_1+1} = U^* \qquad \frac{a_1}{(((\,a_2^*)\,a_3^*)\,a_4^*)\;a_n-1} = N^*$$

$$((((\,a_1^*)\,a_2^*)\,a_3^*)\,a_4^*)\;a_n = a_1 + (N^* - I)$$

$$a_2^* = a_2 - (I - U^*)$$

$$\frac{1009.496}{10{,}000+1} = 0.101 \qquad \frac{10{,}000}{1009.496-1} = 9.916$$

$$((((\,a_1^*)\,a_2^*)\,a_3^*)\,a_4^*)\;a_n = 10008.914$$

$$a_2^* = 1008.595$$

Finally:

$$\frac{((((\,a_1^*)\,a_2^*)\,a_3^*)\,a_4^*)\;a_n}{a_0+1} = U^* \qquad \frac{a_0}{((((\,a_1^*)\,a_2^*)\,a_3^*)\,a_4^*)\;a_n-1} = N^*$$

$$(((((\,a_0^*)\,a_1^*)\,a_2^*)\,a_3^*)\,a_4^*)\;a_n = a_0 + (N^* - I)$$

$$a_1^* = a_1 - (I - U^*)$$

$$\frac{10008.914}{100{,}000+1} = 0.1 \qquad \frac{100{,}000}{10008.914-1} = 9.992$$

$$(((((\,a_0^*)\,a_1^*)\,a_2^*)\,a_3^*)\,a_4^*)\;a_n = 100008.993$$

$$a_1^* = 10008.015$$

$$[a_0^*]\,a_n = 100008.993$$

Therefore:

$$\boxed{\begin{array}{l} [a_n^*]\, a_0 \;=\; 0.597 \\ [a_0^*]\, a_n \;=\; 100008.993 \end{array}}$$

We can summaries these equations as the following:

$$\frac{((((\, a_1^*)\, a_2^*)\, a_3^*)\, a_4^*)\;\; a_n}{a_0 + 1} \;=\; \frac{[a_{0+1}^*]\, a_n}{a_0 + 1} \;=\; U^*$$

$$(((((\, a_0^*)\, a_1^*)\, a_2^*)\, a_3^*)\, a_4^*)\;\; a_n \;=\; [a_0^*]\, a_n$$

$$\frac{((((\, a_4^*)\, a_3^*)\, a_2^*)\, a_1^*)\;\; a_0}{a_n - 1} \;=\; \frac{[a_{n-1}^*]\, a_0}{a_n - 1} \;=\; N^*$$

$$(((((\, a_n^*)\, a_4^*)\, a_3^*)\, a_2^*)\, a_1^*)\;\; a_0 \;=\; [a_n^*]\, a_0$$

We can define intermediary frames of reference as the following:

<u>Intermediary Frames of Reference</u>

$$\frac{[a_{0+1}^*]\, a_n}{a_0 + 1} \;=\; U^* \qquad\qquad \frac{[a_{n-1}^*]\, a_0}{a_n - 1} \;=\; N^*$$

$$[a_0^*]\, a_n \qquad\qquad\qquad [a_n^*]\, a_0$$

Now it is the *time* to answer the question yet not asked: How many intermediaries are necessary in order to make the equations exact, rather than approximations? We need to find a maximum and minimum number of intermediaries, and then we can use this information to make the equations precise. The maximum number of intermediaries will be the limit as **n** approaches all possible values between a_0 and a_n. The minimum number of intermediaries will be determined by the limit that **B** is greater than 1.

If we look at the problem at hand very closely, namely finding the maximum number of intermediaries between a_0 and a_n, we realize that this is actual a continuum problem. In other words, to even solve the question at hand, we must refer to the Calculus to know what the ultimate limit is that **n** approaches. Referring to the limit as defined in C3, where zero is the power set of the infinites, zero is its own reciprocal, zero lies at both ends of the continuum, and zero is the ultimate limit of intermediaries between two subjects.

When we solve for $[a_0^*]\,a_n$, the initial value and the initial intermediary are so close, that in fact they are the same value. Since they are the same value, **N***=1, and **U***=1. Likewise, when we solve for $[a_n^*]\,a_0$, the final value and the final intermediary are so close, that in fact they are the same value. Since they are the same value, **N***=1, and **U***=1. With the maximum number of intermediaries, there is no variance in relative time; rather, the maximum number if intermediaries represents linear time without variance.

Therefore:

$$\frac{[a_{0+1}^*]\,a_n}{a_0 + 1} = 1 \qquad \frac{[a_{n-1}^*]\,a_0}{a_n - 1} = 1$$

Since the identity constant is 1, there are no relative frames of reference. Therefore, in the case of the maximum number of intermediaries, both subjects exist in the same frame of reference; linear time.

Consequently, linear time is the expression equivalent to the limit of all possible rational experiences between at least two subjects in a one to one correspondence, as the limit approaches the maximum number of intermediaries.

$$\lim_{n \to 0} [a_0^*]\, a_n = a_0 + (1 - 1)$$

$$\lim_{n \to 0} [a_n^*]\, a_0 = a_n + (1 - 1)$$

We can define maximum and minimum intermediary frames of reference as:

Mamimum Intermediaries

$$\lim_{n \to 0} [a_0^*]\, a_n = a_0$$

$$\lim_{n \to 0} [a_n^*]\, a_0 = a_n$$

Minimum Intermediaries

The least number of intermediaries such that **B** is greater than 1.

Now it is possible to construct a proper equation that integrates the values from maximum to minimum and gives us the curves for two or more subjects.

The curve relative to **A** and the curve relative to **B** both exist in two dimensions of time: future-past (x-coordinate) and positive-negative rate of change (y-coordinate). What must be stressed is that in both of these curves of time **A** and **B** do not intersect; only in linear time that we find **A** and **B** intersecting. Therefore, it must be concluded that there is a third dimension of time. If we examine this idea of linear time, we see that it intersects the present time in sequences of different present moments, or it intersects periods of the same present. If the rate of the passage of time is designated as the y-coordinate, if the sequential periods of linear time are designated as the x-coordinate, then the third dimension of time is designated as the z-coordinate: a dimension of the present; a perpetual present tense. Re-thinking this idea, it becomes intuitive, yet striking to acknowledge that time has three dimensions just as space. This new addition to the symmetry between space and time gives space/time a six-dimensional basis.