

Developmental Time/Space Continuum Theory: The Dimensionality of Space and If Time is Space in Motion: A Technical Research Note

Jean Piaget has influenced cognitive theory with how children develop their concepts of space and time. The theory delineates a four-stage process of moving from sensori-motor to pre-operations to concrete operations and finally to formal operational thought. The developmental process is one of increasing complexity as the child internalizes and builds upon their concepts of space and time. It is almost as if they have a Spatial Acquisition Device (SAD), similar to Noam Chomsky's LAD – Language Acquisition Device.

One of Piaget's most important discoveries is the concept of object permanence in which the child begins to understand that an object exists even when it cannot be viewed. Prior to object permanence when an object is removed from a child's sight, it no longer exists. This acquisition of object permanence occurs in the first two years of life during a child's sensori-motor stage of cognitive development. The child develops the sense of being as having a permanent existence physically. So just as the child has learned about three dimensions physically through movement in the first two-years of life, the child begins a journey of internalizing how they learn about dimensionality over the next three stage of Piaget's theory in moving from one dimension to two dimensions and finally to three-dimensional space.

Piaget invented a very unique experiment to test for this acquisition called "conservation experiments" in which he devised experiments for one-dimension (number), two-dimensions (area), and three-dimensions (volume) (see the following chart).

<i>Dimensionality</i>	<i>Conservation Experiment</i>	<i>Stage of Piaget's Theory</i>
0 Dimension	Object Permanence	Sensori-Motor
1 Dimension	Number	Late Pre-Operational
2 Dimensions	Area	Concrete Operational
3 Dimensions	Volume	Concrete Operational

This acquisition is invariant, it may occur at different ages for children but they are not going to go from object permanence to area before going to number, for example. Recent research has demonstrated that Piaget's stages may occur a bit earlier than suggested by the theory, but the invariance of spatial dimensionality has not been challenged. This is an important discovery since it could lead us to a Spatial Acquisition Device (SAD), which has implications in how we interpret the world. Are our brains pre-wired to interpret the world within three-dimensions and if so what could be the next logical step in understanding the relationship between space and time. For example, is time (T) just space in motion (Sm) as depicted in the following formula: $T = Sm$. This idea and its potential implications are being developed in a way as suggested in the following section of this technical research note in attempting to

develop a deep structure within epistemology regarding space and time between the physical and cognitive worlds.

The Developmental Time/Space Continuum Theory: The Implications if Time is Space in Motion

The Developmental Time/Space Continuum Theory has gone through several revisions and enhancements since being first proposed in 1975. Over the past five decades it has moved from being a cognitive theory to more of an epistemology theory dealing with time and space as both physical and psychological concepts.

Picture two triangles, one a right-angled triangle, the other an isosceles triangle imbedded within the right-angled triangle. One of the triangles is space (right angled) the other is time (isosceles)(see figure at end of this narrative). As space increases or decreases in speed, time slows down. Now picture at the end of the space triangle there is a singular point where space is a singularity and is stationary. Time as depicted in the isosceles triangle shows time slowing down as it approaches the same singular point. The same is true with the triangles at the other end of the continuum where space is moving at least or close to the speed of light and time as depicted in the isosceles triangle has slowed to a crawl.

The stationary space represents a black hole as a singularity where time has lost meaning and different events could occur at the same time, such as having a cat that is both alive and dead. Space equals time. When time has become stationary, space as represented by filled space, Mass, is moving at or close to the speed of light and is transformed into Energy.

With these two imbedded triangles, both intersect at some point depending on how fast or slow space and time move. This intersection is our world, it is our reality, where the three dimensions of space and the dimension of time coincide.

I have suggested in previous iterations of this theory that black holes are the anchors to our universe and keep it from expanding out of control. Go back to the right-angled and isosceles triangles. At the beginning of the universe (The Big Bang) the time triangle dominates while the space triangle is at a minimum. Energy dominates with stars being born. It is only when they begin to die off and form black holes that the universe begins to slow down and a shift begins with the two triangles and the space triangle begins to grow larger and larger while the time triangle grows smaller and smaller until the stationary space singularities act as a drag on the universe and it gradually goes into the Big Collapse. And the universe does it all over again.

With this model, it supports the notion of multiple realities but in more of a sequential fashion rather than concurrent. As the universe regenerates itself over and over again in Big Bangs and Big Collapses it provides the opportunity when time and space intersect to form new realities, just not at the same time. The only way for that to happen where two realities can exist at the same time is when space is stationary and time does not exist which occurs in a singularity.

Time = Space in motion (T = Sm)

