

## Study Notes

# Time in Life and Life in Time: Between Experiencing and Accounting

SATO Tatsuya and VALSINER Jaan

(College of Letters, Ritsumeikan University / Department of Psychology, Clark University)

Time operates on human lives in two ways—as an inherent duration that is inevitably blended with irreversible experiencing, and as an abstract quality on which different marker events create the possibility of making time into a measurable commodity. We propose an investigation of how the two time perspectives are transforming each other — chronogenesis — and to provide both phenomenological illustrations and cultural psychological methodology of such transformations. HSS, TEM and TLMG are introduced as promising paradigm for a new methodology in cultural psychology.

**Key words** : genesis, chronogenesis, duration, transformation TEM

### 1. Introduction: The Experience of Time

Everyone agrees that happy times of the pleasurable kind seem to pass faster than stressful times. When we are in a deep sleep and then wake up, we feel the time as if it had been a moment. We fall asleep instantly—and eight hours later when we wake up, it seems to us as if just a short time has passed. On the other hand, an insomniac— a person who is continuously struggling with habitual sleeplessness— suffers what feels like a long time every night before the transition to sleep. Time sometimes “flies” and at other times “drags” —as all of us know. There is a deeply subjective flow involved in living-within-time. Imagine that you decided—or were asked to—do five-hundred push-ups. This is a difficult experience for nearly everyone. You start and then cannot count anymore. You feel that this

simple torture is never-ending. It is another kind of pervasive time experience. You cannot go back to the state you were before you embarked on the path to the five-hundred push-ups. You function in pervasive and irreversible time. This corresponds to the suffering of terminally ill patients. Though pleasurable and distressful experiences are both pervasive, feeling relaxed might correspond to an extension of space feeling. In fact, Bergson (1907), in his work “*L'évolution, corrélate détente* (i.e. relaxation) to extension, or *créatrice*.” Therefore, distress might correspond to convergence of time.

According to Bergson, time is persistent—it

- 
- 1) It is important not to forget that “nothing” is not the absence of all experience, but a special experience of feeling nothingness. Human beings cannot literally “do nothing” —if they live in complete sensory isolation their minds create something out of such “nothing” — hallucinations.

is part of everything we do—even our experience of “doing nothing<sup>1)</sup>” takes place within time. It is within each biological, psychological, and social event—inseparable from all the growing systems. Pervasive, but irreversible time is experienced during listening to harmonious music. Or, imagine yourself sprawled on the ground and looking up at the sky, when a cloud comes floating in from out of your range of vision, you experience pervasive and irreversible time. Then, it starts to rain! You wonder if you should get up or not. Rupture occurs, and options emerge. You should decide to get up or not.

Yet aside from living-within-time, there is also the *clock time*. For contrast, we call “non-lived” time, such as “objective” time, “clock time.” “Clock time” is based on some basic unit of time. Any measurement of time depends on a procedure that focuses on astronomic and/or physical phenomena for constructing the unit of time. The waxing and waning of the moon and the length of the shadow caused by sunlight are used for creating the calendar and/or clock. Water and sand are also used as indices of homogeneous continuing time. Today, oscillations of physical processes are used for precisely tuning the clock.

## 2. “Lived time” and “clock time,” are they creating harmony?

### 2-1 “Lived time” and “clock time”

Mizuki and Minami (2010) have shown how school children prefer to walk narrow and devious back streets—rather than walk on the sidewalk of the main street. Children prefer

back streets, because they can see flowers, encounter insects and animals and enjoy *Michikusa* with friends. *Michikusa* literally means “grass by the side of the road,” but in the vernacular, it refers to dilly-dallying, as a horse would dilly-dally by stopping to eat the grass. Examples of *Michikusa* are many: a sword battle using parasols, playing with cats and so on. Some children even do homework by studying nature on the street.

However, the pleasures of *Michikusa* for children irritate mothers and teachers. Or, maybe the adults’ irritation with children is a *Michikusa* experience for them—who no longer feel the immediate pleasure of encountering a new insect on the street. Even as the street is narrow, the story is wider—we are all enjoying *Michikusa* on our way, in our lives—we enjoy being within our time. And, all our social worlds are expecting us to be “on time” for one objective or another. Thus, we can find that there might be a decarage between time in vivid living or “lived time,” and “clock time” that depends on the movement of clock’s hands.

Can “lived time” and “clock time” be synthesized into one? And would there be universal harmony of time? Yet, that would require that social institutions stop using “measured time” and/or “counting time” as a social organizing feature. Can that happen? Living in time entails social cohesion—there are “times of prosperity,” and “times of economic depression.” Young people who decide to get married plan a wedding “high time” (German—*Hochzeit*)—to experience the transition in their irreversible life experience. They cannot reverse that event by “taking it

back”—they can only move forward to the end of their marriage in another transition in time—death or divorce. According to Lewin (1939), “Persons of all ages are influenced by the manner in which they see the future, that is by their expectations, fears and hopes...” (Lewin, 1939; p.878). Because Lewin suggested that time-related actions depend on a person’s age, we need to consider a longer time scale than the *Michikusa* time scale. Children enjoying their *Michikusa* have rather a short time perspective of a day after school. However, we usually have a longer time perspective and represent time in various ways. Next, let’s consider a longer time scale, such as the life time.

## 2-2 Lifetime, life course and life cycle

At first glance—the meaning of lifetime is simple—it ranges from birth to death. Yet if we start thinking about human culture, the question becomes fuzzy. Why consider a lifetime as starting at birth—rather than from the moment a pregnant woman feels the movement of the foetus, or the father-to-be delivers the much needed sperm into the vagina? Does a stillborn child have a lifetime—before birth?

Furthermore—who determines the limits of a lifetime? As the irreversible time flows without our noticing it, it is the setting of time limits (*Terminierung*) that makes time perceivable phenomena and emerge in the context of specific time-marking events. The doctor performing an abortion is introducing such a marker event into the life course of a woman. The military general sending young soldiers to a heroic battle from which nobody

returns, creates a rupture not only in the lives of the to-be-dead soldiers, but also in the historical account of a lost battle. An insurance company that insures an old person by some expected estimate of how many more years that person might live—a marker that is deeply discomfoting to the person who does not appreciate such a chronicle of the death foretold. Here, we can see that deciding and/or inferring with the end of life creates non-lived time and these are principally destructive. On the other hand, some regard the end of a person’s life as a part of an eternal cycle.

As Müller and Giesbrecht (2006) emphasized that both Rudolph (2006) and Yamada and Kato (2006) were critical of a linear, homogeneous and unidimensional model of time. From their different perspectives, both formulated alternative conceptions of time. Rudolph (2006) proposed a mathematical model of psychological time (‘full time’) that is inhomogeneous and ‘one-dimensional only in a global sense.’ Yamada and Kato (2006) suggested multiple and coexisting views of time, even if they were somewhat contradictory. They also suggested that the Generative Life Cycle Model (GLCM) that described temporal phenomena from a subjective perspective. The GLCM is process oriented rather than goal-oriented, with a perspective that is ‘free’ from an individualistic point of view, so that dying is represented as a meaningful transition in a reversible spiral of time (Hood, 2006).

Last—but not least—the meaning of a lifetime can transcend the actual biological birth and death periods. The long-dead ancestors are “alive” in the ritual mythologies of the living. The recently dead spouse is very

much “alive” for the partner who is alive and visits the grave (Josephs, 1998). Children can be killed—for the reason of their connection with very much alive “malevolent spirits” —or everything can be done to honor children who are alive and keep them safely alive, because of their connection with “benevolent spirits.” Social practices—such as the Yoruba (one of the major ethnic groups in Nigeria) moving from twin infanticide to twin honouring implies a period of uncertainty within the cultural meaning systems (Valsiner, 2001, p.187). Among the Yoruba, the practice of twin infanticide has been transformed into that of twin adoption. Today, the birth of twins is a predestined event that is to be regarded as a lucky omen. Since twins are a special gift from God (Chappel, 1974). But the historically prior state of affairs in treating twin birth among the Yoruba was that of obligatory infanticide of twins. This was transformed through some members of the Yoruba society who lived in exile—innovation comes on the margins.

### 2-3 Time without life

Next, we focus on an even longer time scale, or cosmic time, which is far beyond the history of *Homo sapiens*. The cosmic time is not experienced by any person. In fact it would be mind-boggling for ordinary humans to consider time as a measure of cosmic distances.

For example, the star Mizar/Alcor shown by the arrow in Figure 1 is a double star—a visible combination of two stars. People with good visual acuity may at times see two stars next to each other in the location indicated by the arrow in Figure 1. There are indeed two stars—and both of them are dual (consist of two stars orbiting each other)—yet they are not as they seem to the naked eye. Mizar is 78 light years from us, Alcor—81. It takes light 78 years (of our Earth’s time) from Mizar to arrive onto our *retina* at the moment of looking at the star. To add to that contrast—the light from Alcor has taken 3 more years—yet arrives on our *retina* at the same moment as we look at both of them. What is an instant perception of a star for us, is the result of moving celestial bodies where time is equally



Figure 1. The double star Mizar/Alcor in the constellation *Ursa Major*

important—yet there is no subjective perceiver of time moments. Stars and galaxies emerge, develop, and become extinct—with time irreversibly. Yet there is no reflexivity involved—no thinking substance has so far been discovered among the celestial bodies other than on Earth, so far.

In 1927, Edwin Hubble first observed that light from distant galaxies is red shifted and that galaxies are moving farther and farther away from us. It means the universe is expanding. If we take the expansion process backward, the universe must have begun its expansion sometime, somewhere. Astronomers call this event the Big Bang. And astronomers estimate that it took it approximately 15 billion years to grow to the present size for our universe. Big Bang theory –expanding universe theory- never covers the period before the bang. The theory posits that the bang was when time started. But, once it started—how does it continue? It is unfeasible to think that time was created by the Big Bang at an instant—before it there was no time, and after it—time miraculously emerged as a given dimension within which the cosmos has existed ever since. The events that were started by the Big Bang must create, or invent time as a form of organizational bricolage.

#### 2-4 Toward the notion of *Chronogenesis*

Thus far, we have considered the relationship between time and life at various levels. Conflicts between the lived time and the clock time, *Michikusa*. Time and human life; Life course and/or cycle. Time far beyond the history of Homo sapience; the light from the double star. Such discussions depend on the existence of

time. Is time a premise for human life? If we could throw away time as a premise, the dichotomy between clock time and lived time should also be thrown away.

Let us re-consider the Japanese concept of *Michikusa*. Every school-child is fond of *Michikusa*, but no mother is. While the mother worries - where is my child? The child lives in a person's all-involving personal time (*durée*). The child takes the time to enjoy the moment- and is "late" for school or home. The mother—or the teacher—lives in a control-dominated "clock time" world. They define what "being late" means ("you are late for the 8.00 am class today!"). And the child answers— "Yes, but I saw a beautiful rainbow on my way to school." For the child, there exists no "being late" ... just "being." The "just being" is actually eternal becoming—creation of novelty. James Mark Baldwin (1906) called it persistent imitation—imitation of what we see in ways that go beyond what we see. We create new ways of looking at the world, we behave in new ways, and we seek out experiences that we find meaningful— as solid bases for "where we are" as well as situations for new adventures.

#### 3 Chronogenesis in understanding human cultural lives

Continuing *Michikusa* is just being and is also the accumulation of the constant decision-making what to do within irreversible time. Here we can see the core of CHRONOGENESIS. Time emerges with just being and continuous decision.

### 3-1 Chronogenesis

We feel it is time to establish the centrality of chronogenesis in the understanding of human cultural lives. Chronogenesis is the cultural invention of time in all of its forms—repetitive (clock, time unit measurements), indicative (the “snow rabbit” and its implications in Figure 2), existential (“lifetime” as seen through social representations—Yamada & Kato, 2006), or an abstract formal (Rudolph, 2006). Time is irreversible—both in its role, in all processes of emergence (symmetry-breaking—Prigogine’s irreversible thermodynamics), and in our personal-cultural construction of it. The latter constructions are cultural means—semiotic devices—in organizing our lives.

Irreversibility of time makes the phenomena of becoming possible. Driesch (1914) explained the notion of becoming as follows.

At one moment I “have” this consciously, at another I have that, and then again I have something else, and so on. This is the so-called stream of consciousness. But there is nothing like a stream quite immediately given to me: on the contrary, my having consciously is always a “now”, or better still, it is entirely unrelated to time. I have this immediately object, this contents which I have consciously there can be distinguished a very peculiar class of that may be called signs; and these *signs*, which are had in a now, mean “not now but then (*i.e.* earlier)”, and they may even mean “earlier than”. (Driesch, 1914; p.191)

According to Driesch, signs are very important for becoming and then for genesis. Here psychological science could find a way to consider the processes of emergence—yet in its present state of affairs psychology is very far from creating an adequate theory of emergence. The statistical orthodoxy it suffered in the recent past (Gigerenzer et al, 1989 ; Toomela, 2008) blocks its innovative capacities. Likewise, the norm of study of samples (Valsiner & Sato, 2006)—rather than individual cases over time—has limited the handling by psychology of its phenomena. Wilhelm Roux, who created *Entwicklungsmechanik* (“mechanics of development” or genesis), defined genesis as a visible process of variety. Even though the biological proof of Roux’s insist was denied by Driesch’s famous sea urchin experiment, Roux’s theoretical ground is useful for the theory of development.

### 3-2 *Zeit* and *Stunde*

In German<sup>2)</sup>, there are two basic words to present time. One is *Zeit* (time in general) and the other is *Stunde* (hour). *Zeit* is a general

---

2) Why select German—rather than any other language (Swahili, Chinese, Hindi, or Latvian) for elaborating the example here? It may be a historical artifact that psychology as a science emerged from philosophy in the Occident under the dominant role of the German language (and history). To understand that past—and to extend its implications to generalized knowledge applicable to our globalized world, tracing key concepts of philosophy and psychology to their German heritage is useful. Interestingly there are two words in Japanese language, *Jikan* (時間) and *Jikoku* (時刻). “Kan(間)” in *Jikan* (時間) is the duration, and 間 is pronounced as “Kan” and “Ma” in Japanese, thus *Jikan* seems to correspond to “*Zeit*” in German. On the other hand, “*Koku*(刻)” in *Jikoku*(時刻) means “ticking down” so this word seems to correspond to “*Stunde*”.

term for irreversible and pervasive time. *Stunde* is a unit- representing distinguishable and measurable time. It is not marked by irreversibility—one can talk and think of hours (*Stunde*) as if these are entities, consider them measures of work (e.g. “35 hour workweek”). In contrast, the irreversible time is marked by distinctions that fit under the German term *Terminierung*—creating specific time points (markers) on the irreversible timeline<sup>3</sup>. A *Stunde* is one of the abstractions from the process of *Terminierung*—alongside with many others (day, season, lifetime, light year, etc.) When *Terminierung* is created by any process that reflects upon irreversibility—usually the human thinking—then accounts of time emerge. This is what we call chronogenesis—the emergence of signs that mark time (moments, periods, quality, etc) by the person in dialogue within oneself under the pressures of the eternal flow of the irreversible time.

Our story of chronogenesis builds on the synthesis in Bergson’s philosophy of time and James Mark Baldwin’s “genetic logic” (Valsiner, 2008, 2009). Bergson professed time is occupied by space when the word “measurement” is used. The notion of “measurement” by the beginning of the 20<sup>th</sup> century had taken on a mechanistic form—largely by the focus of spatial measurements (e.g., the etalon of a meter). Psychology needs to reverse our way of thinking about the relationship between time and space, that is, chronotope. All living beings

live in concrete space, thus, chronogenesis occur neither in vacuum nor abstract space.

### 3-3 Harmony between place and time; Chronotope and its meaning

Time should never be regarded as space. If we said “measurement of time,” the notion of space would invade the notion of time. Therefore, to escape from such danger, we should pay attention to the concept of chronotope and its example. Chronotope comes from the Greek words for time ( $\chi\rho\nu\nu\omicron\varsigma$ ) and space ( $\tau\acute{o}\pi\omicron\varsigma$ ). Thus, the word “chronotope” can be literally translated as “time-space.” This is a term taken over by Mikhail Bakhtin from 1920s science (Einstein’s theory of relativity) to describe the manner in which literature represents time and space. Chronotope is defined as “the interrelation between time and space.” For Bakhtin, the notion of chronotope was a tool for the critiques of historical literature, this notion helps psychologists to integrate the concept of time and space with the real person. We easily forget the simple fact that each person’s life is itself irreplaceable and life should be respected from the viewpoint of chronotope. For example, Morioka (2008) focused on the relationship between the client and the therapist, which occur in irreplaceable time and space and he called it the “therapeutic chronotope”

Actually, the life of humans is not dominated by clock-time. Japanese farmers need time perspectives and it does not depend on the calendar. In Japan, melting of snow tells farmers the timing is right for planting the rice crop. Such a moment entails their creation of the time-to-be (and does)—*chronogenesis* (Sato

3) The roots of *Terminierung* go back to Latin—*terminare*—meaning “to finish”. It can be seen as the act of introducing “terminating points” for various events onto the non-marked flow of irreversible time.

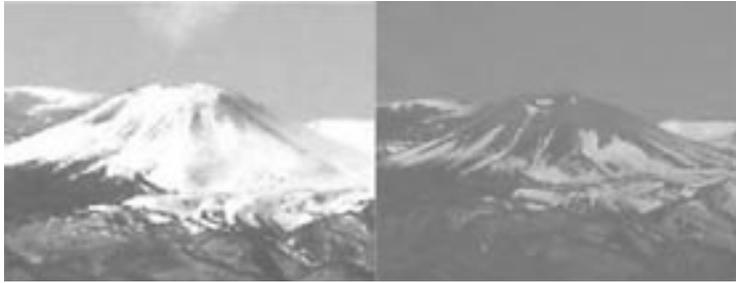


Figure 2. The snow-scape of Mt. AZUMA KOFUJI in Fukushima Prefecture in Japan

and Valsiner, in preparation). Farmers never start planting on just the same day of the calendar (for example May first every year). Planting depends on the climate. The farmers have the wisdom to know the good timing (Figure 2) for planting—generalizing from their seasonal experience.

Beginning to plant on the same day every year does not promise a good harvest. We can say that signs of future perspectives guide the farmer's plan for planting. Here is one example that the planting of rice by farmers in Japan is guided by a constructed sign.

Can you find the rabbit on the right photo in Fig.2 The mountain in winter seen on the left photo is fully covered by snow. Time passes. The snow that remains on the mountain in the right photo takes on the form of a "rabbit." Farmers call this shape, "*YUKI USAGI*" (*Yuki* means snow and *Usagi* means rabbit). Farmers also call this rabbit "*TANEMAKI USAGI*" (seed-planting rabbit), because it represents the climate favorable for planting and informs the proper temperature for the start of spring rice cropping. More importantly, it makes farmers expect the autumn harvest. Whenever rice farmers see the snow rabbit, they start the planting. In other word, after seeing the rabbit, the rice cropping starts<sup>4</sup>.

Each place has its own timing for starting based on the chronotope. Cronotope is regarded as the genesis of time, chronogenesis.

### 3-4 From the "arrow of time" to the "broom of time".

The asymmetry of the future and the past (Figure 3) creates a situation in which the traditional ("objective time" model based) notion of the "arrow of time" does not fit. The future is rich in potential courses of events, whereas the past is characterized by unilinearity—in our "objective" retrospect. Aleksander Anisov (2005) has suggested the use of a new metaphor— "the broom of time" (Figure 3).

Since the future is constantly in the process of becoming the past, movement towards the "new present" (to become past) entails losing the features of possible future trajectories (loss of predicates in terms of logic). In Figure 3 this amounts to ignoring "branches" of the possible future as the singular present course is being created. Once this has happened the

4) It is different from the mode of workers demonstration. Modern factory workers gather and call on the same calendar day (May first). Even if they could fight with the capitalists, they are ruled by the system of "Modern time." It reminds us of a famous movie.

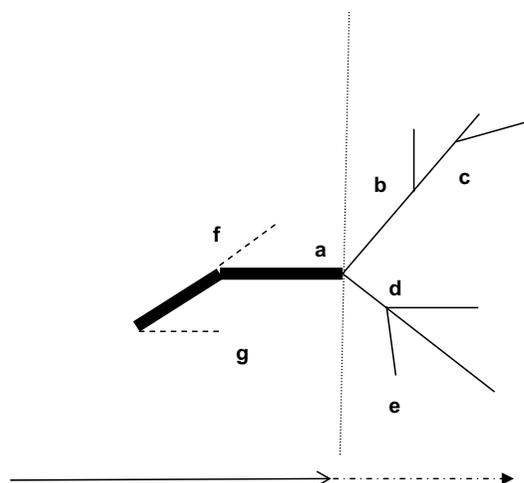


Figure 3. The broom of time (after Anisov, 2001)

(by now) present becomes immediate past—with the loss of the “branches” crystallized. According to Anisov,

The mentioned removal of ignored branches is of great importance for an adequate understanding of the phenomenon of the past. Earnest historians come to a conclusion that *history does not allow of subjunctive mood*. Any argument about what would have happened if dinosaurs did not exist, if Napoleon was killed in his youth, or if Lenin was arrested in 1917 by czar’s authorities, contain no scientific meaning and may not have any. The offered axioms of time order precisely express this specific aspect. The past has no valid alternatives even given that sometime back certain past meta-moments contained the listed events in the zone of real possible future. The essence of the issue is in the impossibility to return back to such meta-moments (Anisov, 2005, p. 81).

Thus, the branches f and g in Figure 3 would be inaccessible from the point of view of temporal logic. A century before him, his predecessor in the effort to build logic of development, Baldwin (1906) commented on the issue of how to study development:

that series of events is truly genetic [developmental] which cannot be constructed before it has happened, and which cannot be exhausted backwards, after it has happened (Baldwin, 1906, p. 21).

What seemed an agnostic or nihilistic statement hundred years ago makes sense in conjunction with temporal logic as it had developed in the second half of the 20th century. Overcoming the institutional habits of “mainstream” psychology, to “predict” different separated “variables” over time as the “study of development” becomes obvious when one moves from an axiomatic system of time as a moving event-organizer between past and future to empirical investigations. Any developmentally oriented science requires the establishment of its own concise theoretically elaborated and phenomenological research methodology, in which the qualitative and dynamic features of the phenomena are preserved in the data. The methodology used in “mainstream” psychology is incapable of producing adequate knowledge about development (For elaboration of this point see Smedslund (1995), Toomela (2007, 2008, 2009), Valsiner & Rosa (2007).) The axioms of “mainstream” psychology exclude the focus on development—hence

psychology has been blind to the notion of “qualitative transformation” in lived time. Genesis needs time and form changes, and therefore, transformation occurs within time, its principle is qualitative (not quantitative).

**3-5 Genetic logic for chronogenesis as a transformation of structures**

There are very few logical systems that belong to the category of logic of emergence—a formal rule system by which something comes from nothing—or from something else (e.g., Herbst, 1995). James Mark Baldwin’s “genetic logic” (Baldwin, 1906/1908a/1908b) was one such a system, providing rules of thought about emerging phenomena. Baldwin tried to phrase a general philosophy of development in terms of logic. It was a schema-based logic of apprehension—its main issue was to formalize the move from the present to a possible future (apprehending of the future). The future is being apprehended through the present, on the basis of generalizations from past materials. The uncertainty of the apprehensive process is the birthplace for construction of meanings in the present, facing the future with some illusion of determinacy (Valsiner, 2002/2009). Baldwin’s focus makes the irreversible time as the core of his “genetic logic”.

Any conceptualization of time is based on an abstraction that differentiates time from things and processes that occur in time (Wieland, 1985). However, if time is inevitably bound with things and process, how can we differentiate them? There is no pure time, as there is no pure space. It is the notion of transformation that makes it possible to understand life within time. Central to

understanding development is the notion of transformation (Valsiner and Connolly, 2003). Here we should not regard that transformation occurs *along with* time. Transformation is a time-inclusive concept—as the transforming organism accomplishes its development through time. Trans-form implies changing of form, i.e., some form of the previous kind turns into a new form (Sato, Hidaka and Fukuda, 2009).

It involves moving towards the future on the basis of the web of the real and potential trajectories of the past (Figure 4). Here we need a methodology for describing the transformation (Valsiner, 2001) and/or the broom of time (Anisov, 2001).

Bergson’s notion of adaptation does not mean that the environment “molds” or “shapes” the organism. Instead, the environment triggers the emergence of new forms—biological and symbolic alike (Valsiner, 2004). In sum-- in the case of creative adaptation, the organizational forms that emerge in adaptation go beyond the “fit with” the present state of the survival conditions, and set the basis for facing the challenges of possible future demands.

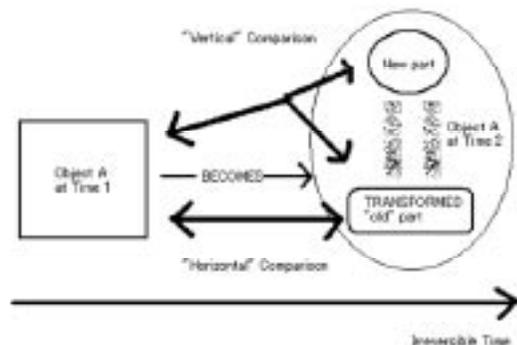


Figure 4. Transformation of form (from Valsiner, 2001)

Bergson's notion of becoming on the material of human personality was expressed in his characteristic ways:

Our personality, which is being built up at each instant with its accumulated experience, changes without ceasing. By changing it prevents any state, although superficially identical with another, from forever repeating it in its very depth [*En changeant, elle empêche un état, fût-il identique à lui-même en surface, de se répéter jamais en profondeur*]. That is why our duration is irreversible. We could not live over again a single moment, for we should have to begin by effacing the memory of all [*souvenir de tout*] that had followed. (Bergson, 1911, p.8 ; French versions inserted from Bergson, 1907/1945, p.23)

In a dynamic universe of a chronogenetic kind, time cannot operate as an independently given. It can be eventually abstracted as a static entity by the mind that attempts to create stability—yet it is merely a generalized illusion.

Bergson's notion of duration is such a pure duration and it is the form that the succession of our conscious states assumes when our ego lets itself live, when it refrains from separating its present state from its former states (Bergson, translation: p.100).

#### 4. Conclusion: New methodology for “time-conscious psychology”

Psychologists have principally disregard the notion of time, because abstract and timeless “true and universal knowledge” should be

the objective of this academic discipline. Yet psychologists need to consider the notion of time—differently from how they have treated it, only as an extrinsic and independent factor in research. Here, in psychology, not “lived time” but “clock time” is regarded as the important scale for understanding psychological mechanisms. Experimental psychologists use reaction time based on the clock time to infer the internal mechanisms of memory and/or other cognitive processes. Developmental psychologists use the chronological age as the external scale for understanding the maturity and/or declination of the function of an organism.

Therefore, if we want to reach to treat “lived time” in psychology, we need a new methodology. We have invented a new methodology for describing human life within irreversible time known as TEM (Trajectory and Equifinality Model; In English, Valsiner & Sato, 2006; Sato, Yasuda, Kido, Arakawa, Mizoguchi and Valsiner, 2007; Sato, Hidaka and Fukuda, 2009; In Japanese, Sato, 2009). One of the important notions in TEM is “Equifinality” and the other is “Bifurcation points (BFP).” Both notions are inevitable for describing the diversity of trajectory, and, if not, causal and linear trajectory (= straight line) stays behind. In Figure 5, each white circle represents BFPs and one of the circles is blackened because it represents the Obligatory Passage Points (OPP).

A person at each BFP looks toward the future and makes a choice. At such a point, time emerges and transformation occurs. As mentioned above, ancient Greeks had two words for time, *chronos* (χρόνος) and *kairos*

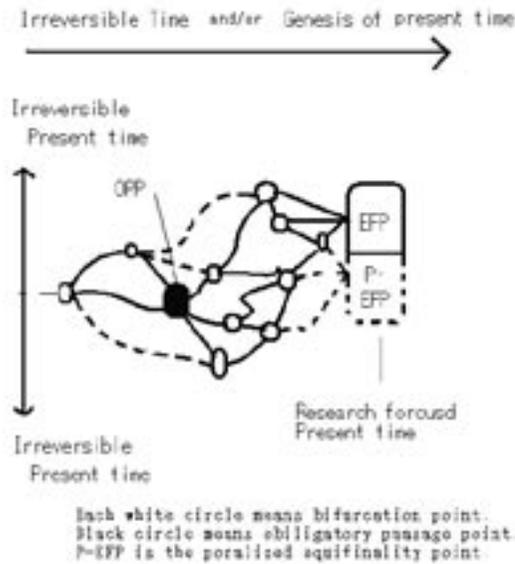


Figure 5. Trajectory and Equifinality Model

(*καίρως*). Whereas the former refers to chronological or sequential time, the latter signifies a time in between, a moment of an undetermined period of time, in which something special happens. Whereas *chronos* is quantitative, *kairos* has a qualitative nature (Freier, 2006). Therefore, BFP is the very point that needs to be described as human experiences in lived time within irreversible time.

What would happen at the BFP?

We can see in Figure 6 the two opposite powers that are in conflict between social direction and social guidance. Each person is supposed to have his/her original orientation to EFP. It is called, "Synthesized Personal Orientation (SPO)" and SPO reflects the fluctuated orientation and open-systemic nature of human being within irreversible time (Sato, Hidaka & Fukuda, 2009). A person proceeds with his or her orientation as an open system (which means that the orientation is not internally derived) and struggles to realize

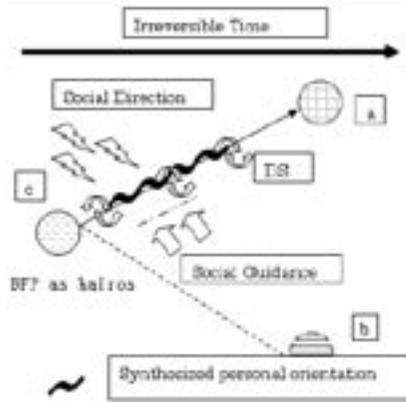


Figure 6. The making of the future: BFP as the point of transformation and brooming time

own orientation against the social directions (SD) with the support of social guidance (SG) supplied by intimate social relationships. Therefore, we could define time in BFP as the time of *kairos* within irreversible time (time of duration).

TEM can depict the two different modes of time, "*kairos*" and "*durée*." Chronogenesis in our life occurs at a decisive point in peaceful and/or mundane life. Even as our social life in modern times might be controlled by "clock time," our life ought to be considered as embedded in the time of *durée* and something happen at the time of *kairos*. TEM as a new methodology in psychology makes it possible to describe and understand life in irreversible time with chronogenesis.

## References

- Anisov, A. (2001) Svoistva vremeni [features of time]. *Logical Studies* 6, 1-22.
- Baldwin, J. M. (1906) *Thought and Things: A Study of the Development and Meaning of Thought, or Genetic Logic.*

- Vol. 1. *Functional Logic, or Genetic Theory of Knowledge*. London: Swan Sonnenschein & Co.
- Baldwin, J. M. (1908a) *Thought and Things: A Study of the Development and Meaning of Thought, or Genetic Logic. Vol. 2. Experimental Logic, or Genetic Theory of Thought*. London: Swan Sonnenschein & Co.
- Baldwin, J. M. (1908b) Knowledge and imagination. *Psychological Review*, 15, 181-196.
- Bergson, H (1907/1945) *L'Evolution créatrice*. Genève: Éditions Albert Skira.
- Driesch, H. (1914) *The History and Theory of Vitalism*. London Macmillan.
- Gigerenzer, G., Swijtink, Z., Porter, T., Daston, L. J., Beatty, J. & Krüger, L. (1989) *The Empire of Chance: How Probability Changed Science and Everyday Life*. Cambridge: Cambridge University Press.
- Herbst, D. P. (1995) What happens when we make a distinction: An elementary introduction to cogenetic logic. In T. Kindermann & J. Valsiner (Eds.) *Development of person-context relations* Hillsdale, NJ: Erlbaum.
- Hood, K. E. (2006) Times of life and timing in developmental psychology. *Culture & Psychology*, 12, 230-244.
- Lewin, K. (1939) Field theory and experiment in social psychology: Concepts and methods. *American Journal of Sociology*, 44, 868-896.
- Mizuki, S. and Minami, H. (2010) How children Perceived their hometown from the viewpoint of local environmental interaction. *Ritsumeikan Journal of Human Sciences*, 20, 65-77.
- Morioka, M. (2008) Voices of the self in the therapeutic chronotope: Utushi and ma. *International Journal for Dialogical Science*, 3, 93-108.
- Müller, U. and Giesbrecht (2006) Psychological models of time: arrows, cycles and spirals. *Culture & Psychology*, 12, 221-229.
- Rudolph, L. (2006) The fullness of time. *Culture & Psychology*, 12, 169-204.
- Sato, T. (Ed.) (2009) *TEM de Hajimeru Shitsutekikenkyu*. Tokyo: Seishinshobo. (in Japanese)
- Sato, T., Hidaka, T. and Fukuda, M. (2009) Depicting the dynamics of living the life: The trajectory equifinality model. Jaan Valsiner, Peter C. M. Molenaar, Maria C.D.P. Lyra and Nandita Chaudhary (Eds.) *Dynamic Process Methodology in the Social and Developmental Sciences. Chap. 10*.
- Sato, T., Yasuda, Y., Kido, A., Arakawa, A., Mizoguchi, M. and Valsiner, J. (2007) Sampling reconsidered: idiographic science and the analyses of personal life trajectories. In J. Valsiner and A. Rosa (Eds.) *Cambridge Handbook of Socio-Cultural Psychology, Chapter 4*. New York: Cambridge University Press.
- Sato, T., and Valsiner (in preparation) Chronogenesis
- Smedslund, J. (1995) Auxiliary versus theoretical hypotheses and ordinary versus scientific language. *Human Development*, 38, 174-178.
- Toomela, A. (2007) Culture of science: Strange history of the methodological thinking in psychology. *Integrative Psychological & Behavioral Science*, 41 (1), 6-20.
- Toomela, A. (2008) Variables in psychology: A critique of quantitative psychology. *Integrative Psychological & Behavioral Science*, 42 (3), 245-265.
- Toomela, A. (2009) How methodology became a toolbox—and how it escapes from that box. In J. Valsiner, P. Molenaar, M. Lyra and N. Chaudhary (Eds) *Dynamic Process Methodology in the Social and Developmental Sciences*. New York: Springer
- Valsiner, J. (2001) *Comparative Study of Human Cultural Development*. Madrid: Fundacion Infancia y Aprendizaje.
- Valsiner, J. (2002) Irreversibility of time and ontopotentiality of signs. *Estudios de Psicología*, 23 (1), 49-59.
- Valsiner, J. (2004) Semiotic autoregulation: Dynamic sign hierarchies constraining the stream of consciousness. *Seminar Presentation at the Seminar on Symbolic Forms Ecole Normale Supérieure, Paris, February, 6*.
- Valsiner, J. (2008) Baldwin's quest: A universal logic of development. In J. W. Clegg (Ed.) *The Observation of Human Systems: Lessons from the History of Anti-reductionistic Empirical Psychology*. New Brunswick, N.J.: Transaction Publishers.
- Valsiner, J. (2009) Persistent innovator: James Mark Baldwin rediscovered. In J. Valsiner (Ed) *James Mark Baldwin— Genetic Theory of Reality*. New Brunswick, NJ: Transaction Publishers.
- Valsiner, J., & Connolly, K. J. (2003) The nature of development: The continuing dialogue of processes and outcomes. In J. Valsiner & K. J. Connolly (Eds)

- Handbook of developmental psychology*. London: Sage.
- Valsiner, J., & Sato, T. (2006) Historically structured sampling (HSS): How can psychology's methodology become tuned in to the reality of the historical nature of cultural psychology? In J. Straub, D. Weidemann, C. Kölbl & B. Zielke (Eds.) *Pursuit of Meaning*. Bielefeld: Transcript.
- Valsiner, J. & Rosa, A. (2007) *Cambridge Handbook of Sociocultural Psychology*. New York: Cambridge University Press.
- Wieland, W. (1985) Prologomena zum Zeitbegriff. In H. Schipperges (Ed.) *Pathogenese: Grundzüge und Perspektiven einer theoretischen Pathologie*. Berlin: Springer-Verlag.
- Yamada, Y., & Kato, Y. (2006) Images of circular time and spatial repetition: The generative life cycle model. *Culture & Psychology*, 12, 143-160.

*Received October 1, 2009*

*Final acceptance December 15, 2009*