Chapter 10
Depicting the Dynamics of Living the Life: The Trajectory Equifinality Model

Tatsuya Sato, Tomo Hidaka and Mari Fukuda

The history of the organism is the organism. (Murray, 1938, p. 39)
The flow of the river never stops and yet the water never stays the same.
From "Hojoki: Written from a small square hut" (KAMO no Chomei, 1212)

"Hojoki" is an essay written by and is famous in Japanese literature as an expression of mujō (無常), the transience of the world. The author—Kamo-no-Chomei (1155–1216)—was a monk who renounced the ordinary life in the then-capital Kyoto and lived his last years in simple huts in the countryside. He was one of the great critics and poets at that era. The notion of the flow of river that he evoked is suitable for considering the dynamic aspect of life. A river is a natural stream of water. Even though a river consists of water; the water within a river is never a river itself. And if the time were to stop—we would not be able to distinguish the water and the river.

The notion of the river is not at all simple. The boundary of river and land is vague and changeable. The status of river is vague—nothing would ever be forever. Nevertheless, this complication is a comfortable as a metaphor of life. If we take the systemic view in psychology and we regard human being as the open system, the subject of study is not a discrete individual, but a relationship with the environment. And the boundary of the subject and environment is not so clear. The time flow never goes back with in life—yet the representation of time has many variations (see Yamada & Kato, 2006). In this chapter, we try to show the new notion and methodology for depicting the dynamics of the living and to detect obstacles of depicting the dynamics. We re-consider the life stage theory, the life course paradigm, and the methodology of rating scale, because these seems to be the obstacles to pursue understanding the dynamics of the living.

T. Sato (✉)
Department of Psychology
Ritsumeikan University
Kyoto 6038577, Japan
e-mail: satotster@gmail.com

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The study of a life course cannot exist without the notion of time. But psychologists and sociologists don't take the notion of time seriously. One of the reasons why they tend to disregard time is that their desire is to seek a depiction that focuses on stability. Actually many of them might "find" the stable structure of personality and stable trail of life course as they construct it through data analyses that are blind to variability and dynamicity. This aspiration leads to the correlational studies. For example, psychologists often like to do research to find the correlation between some biological factors and personality—while ignoring the factors of culture. This is a very attractive seduction for personality psychologists because they have an inferiority complex in their relation with what they construe as "the truly natural" sciences. In fact to do appropriate science, both stability and/or structure are very important for psychologists and sociologists.

Changes are not too complicated. If psychologists abandoned their dreams of revealing a time-free "true state" of affairs and started considering time seriously, we would easily find another possibility. The Trajectory Equifinality Model (TEM) which we describe in this chapter is a new methodological device for psychology. It is based on the systemic view and takes the notion of irreversible time seriously.

Obstacles in Treating the Dynamics of the Living in Psychology and Sociology

Differently from Kamo's Heraclitan idea as expressed in the beginning of this chapter, the historiography in the European tradition—especially the usual focus on Ancient Greece—seems to adjust its mode of thinking to the stable ways where thoughts treated as analogs to the classical Greek architecture. Such stability leads psychologists to build stage models of life course development. In contrast, historiography in Japan seems to assimilate the notion of the flow of the river—nothing would ever be forever.

Stage theories entail the idea that when we develop, we go through a number of states that can be described as temporarily homogeneous. This is similar to constructing the building in the main view of history in Western culture. There are many eminent stage theories in psychology. Among them, Freud's Psychosexual stage theory, Piaget's stage theory of a child's thinking, Kohlberg's stage theory of moral values, Winnicott's development stages, Erikson's developmental stage theory of learning self-esteem and trust. For example, Freud took seriously the psycho-sexual energy and hypothesized psychosexual stage theory (Table 10.1).

Table 10.1 Freud's psychosexual stage theory

Oral stage	from birth to 18 months
Anal stage	from about 18 months to 3 years
Phallic stage	from 3 to 6 years
A period of latency	from 6 to 12 years
Genital phase	from 12 years onwards

Table 10.2 Erikson's eight stages and its tasks

Infancy	Trust vs. Mistrust
Toddler	Autonomy vs. Shame and doubt
Preschool	Initiative vs. Guilt
School age	Industry vs. Inferiority
Adolescence	Identity vs. Role confusion
Young adult	Intimacy vs. Isolation
Midlife	Generativity vs. Stagnation
Old age	Ego integrity vs. Despair

After observation of children in many times and places, Piaget posited that 4 stages of cognitive development. Sensorimotor Period (birth to 2 years); Pre-operational Thought (2 to 6 or 7 years); Concrete Operations (6/7 to 11/12) and Formal Operations (11/12 to adult). In a similar vein, Erikson posited his stage account (Table 10.2).

Kohlberg developed a three-level six-stage model of moral development, where each level is broken down into with two stages (Table 10.3).

Even though stage models theorists might insist that they treat the time with in their models, the time within the stage model seems to be discrete. Stage models depend on chronological age—which means the superiority of biological factors is implied.

Maslow's (1943) 'hierarchy of needs' model seems to avoid such tendency. Differently from the usual way of psychologists to study mentally ill or neurotic people, Maslow looked at exceptional people such as Albert Einstein and Eleanor Roosevelt. But, Maslow's model carries with it an ideal value system and retains in a linear progressive model. Both stage model and hierarchy model do not regard the flow and continuity of life as important.

Life Course Studies and the Notion of Life Trajectory

In life course studies we can find a contextual view of trajectories:

> The life course is age-graded through institutions and social structures, and it is embedded in relationships that constrain and support behavior—Both the individual life course and a person's developmental trajectory are interconnected with the lives and development of others. (Elder, 1998, pp. 951–952).

Table 10.3 Kohlberg's six-stage model of moral development

Level 1	Pre-conventional
Stage 1	PUNISHMENT AND OBEDIENCE Heteronomous morality
Stage 2	INSTRUMENTAL EXCHANGE Individualism/instrumentalism
Level 2	Conventional
Stage 3	INTERPERSONAL CONFORMITY Mutual interpersonal
Stage 4	Social system and conscience
Level 3	Post-conventional
Stage 5	PRIOR RIGHTS AND SOCIAL CONTRACT
Stage 6	UNIVERSAL ETHICAL PRINCIPLES

All of the core principles of life course theory have special application to this transition to lifelong development and aging, the role of human agency in making life choices, the constraints and opportunities of the historical time and place, the timing of events and transitions, and the forming and dissolution of linked lives (Elder, 1985; Daaleman & Elder, 2007). Five core principles define the life course as a paradigmatic framework:

1. human development and aging as lifelong processes,
2. human agency,
3. historical time and place,
4. the timing of events in a life, and
5. linked lives.

However, when we look at the empirical uses of the "trajectory" in life course studies we discover that it means just a "pathway". It describes a path of the life lived—but not the dynamics of moving towards the future. Macmillan and Eliason (2003) pointed out that trajectories often referred to long-term involvement in or connection to social institutions and corresponding role. For example, McQuellon et al. (1998) tried to "measure" the trajectory of psychosocial recovery over the first year after bone marrow transplantation (BMT). BMT patients were assessed by many scales—including physical functioning, mood etc—at four times, namely, baseline (n = 86), hospital discharge (n = 74), 100 days (n = 64) and at 1-year (n = 45). And authors found that the recovery trajectory in this patient population showed three distinct trends. These were, (1) linear and improved over time, (2) the trend for overall quality of life was parabolic (worsening at discharge, then improving), (3) the trend for patient concerns over time was linear and worsening.

A trajectory is considered to be the stable component of a direction toward a life destination and is characterized by a given probability of occurrence. A trajectory refers to the tendency to persist in life course patterns (Wheaton & Gotlib, 1997, p. 2). The notion of a life trajectory might be likened to that of a canal. And though the notion of life trajectory allow to change or shift from the established trajectory, it might lead to the feeling of 'life on concrete (non-fragile) track'. Even though Lerner and Busch-Rossnagel (1981) emphasized the individuals' subjective aspect—in their words, individuals are producers of their development, the researches in sociology of life course tends to prefer to the statistics-based longitudinal analyses in which the dynamism of life course is only assessed the point researchers set, so dynamics of living tends to be easily eliminated.

Can Structural Equation Models (SEM) Reflect the Dynamism of Development?

The life course studies tend to use the correlational efficient. Even they use more complicated technique like the structural equation models (SEM), the basic nature of such models has not changed. Because SEM fully depends on the correlation

coefficients as input data—and such dependence conceals both the dynamic and qualitative aspects of the phenomena. Historically speaking, the notion of the correlation was invented to measure the *degree* to which the two variables are *linearly* related. Sir Francis Galton developed the idea that Karl Pearson further elaborated mathematically and invented the formula on the calculation of the correlation efficient now named after him. Because these two eminent statisticians intended to verify the power of heredity, that coefficient was designed to grasp only the stability, not variability, of the relationship between two variables. Even as the result of calculation of correlation coefficient is based on each variable's variability, the result is interpreted as if it pertains to the essential relations between the qualities implicated by the "variables."

Assigning Numbers—Creating Static Properties—And Scale Types

The problems begin even earlier than the calculations of correlational relations. Already at the moment of psychologists' quantification of qualitative phenomena—an act of signification in semiotic terms—the question of what kind of scales are implied is crucial. Scale properties are important. In his seminal paper, Stevens (1946) proposed four levels—scale types—of measurement: nominal (or categorical); ordinal; interval; and ratio. The latter two are combined as continuous variables. He proposed the hierarchy of measurement scales for psychophysics. Although this idea has been criticized by statisticians, it still remains a core organizational framework for quantification in today's psychology. Importantly, the four levels measurement are not convertible in a symmetric way. A number created at the ratio scale level can be converted "down" to interval level and to the ordinal level. But the reverse is not possible—an ordinal level number cannot be converted "up" to the ratio scale level. Five years later, Stevens (1951) proposed the "permissible" mathematical operations for each type of scale—nominal, ordinal, interval and ratio. However, Stevens's proposal has been watered down—the scale types are regularly treated as if they were upwardly convertible—ordinal scale data are analyzed like ratio scale data.

Once a number becomes assigned to a phenomenon, psychologists move to operate with numbers as if these were meaningful. All numbers in psychology calculated in any imaginable way—usually on the basis of convenience of statistical analyses packages rather than honoring their representative meanings. This fits the master narrative of measurement in psychology—psychology tends to use statistics to disguise its discipline as scientific. To continue this disguise, substantiation of "mind" is inevitably needed. And the construct of psychology such as self, personality and many other characteristics are a priori regarded as substantive and stable. As Peter Callero has pointed out:

> … There is a tendency [in mainstream psychology] to focus on stability, unity, and conformity and de-emphasize the sociological principles of social construction. The self that is socially constructed may congeal around a relatively stable set of cultural meanings, but these meanings can never be permanent or unchanging. (Callero, 2003, p. 127)

The easy way of number assignment in empirical studies of psychology and sociology entails the politics of rating scale. It profoundly dominates the act of creating stable constructs through methods created to "measure" them. While focusing on such static constructs, efforts to reconstruct underlying processes which are involved in the rating scale has fragile foundations.

Even research on life trajectory study addicting the correlational coefficient might be unknowingly embedded in creating unrealistic knowledge. On one hand there is a pre-set theory-driven explanation (e.g., a stage theory) that is treated as a given. On the other hand there is the empirical correlational paradigm which turns variability into stability displays. Both theory-driven nature and using the rating scale strategy lead it to a scientific-like but fragmented view of human beings. It is a reductionist view. It's high time to overcome reductionist perspectives—hence a new vision of trajectory is needed. We need another way to access the dynamism of life trajectory and such new methodology needs to grasp the change (not stability) and emphasize the cultural meanings as Callero (2003) insisted.

We propose the new notion of trajectory as a combination of vectors that represent co-existing directions of psychological orientations. A vector is described both by size and direction—so that vectors might express different tendencies and their relationship, and the combination of vectors might be suitable to depict the movements along the life trajectory. But before we step forward, let's look back one of major dispute on the credibility of quantitative studies.

The Person-Situation Debate, and Beyond

Personality psychology is inherently embedded in the closed systemic view. And the personality theory is the fuel tank of non-dynamic view using correlational coefficient method. Once personality psychology had a chance to transform, but it didn't. Here we take a brief look at the debate in personality psychology. A diagnostic measurement system is a lens that actually obscures the dynamics of living one's life.

Personality psychology, developmental psychology and clinical psychology have failed to develop in the direction of the dynamic and idiographic psychology. In psychology, both time-conscious and dynamic (not psychodynamic) view of life are rare. Personality psychology, developmental psychology and clinical psychology would be in a position to treat human life as a whole and depict dynamic transformation within time. But all projects have been

> … as soon as a psychologist reject the idea of closed-systems of psychological phenomena and accepts an open-systems viewpoint, his treatment of the time dimension in psychological research would change. (Valsiner, 1986, p. 352)

Walter Mischel (1968)'s *Personality and Assessment* changed the quality of discussion on personality studies. As Hermans and Bonarius (1991) pointed out, this publication is of particular historical significance in personality psychology. Mischel (1968) transformed discussion on the personality and the debate between personality psychologists and Mischel has been called "person-situation debate".

Mischel's perspective was influenced by social behaviorism of his time—as he insisted on the role of situation, claiming that situational determinants accounted for more of the behavioral variance than individual differences did. So "situationism" is the best label of his position. The illusion of cross-situational consistency might be revealed as myth. Over-time stability is supported by the similarity of situation. Person tends to select the preferable situations. During the debate, typology, trait theory and psycho dynamism found the situationism as their common enemy. Not surprisingly many objections to Mischel's claim emerged from various points of view. Idiographic approaches and the focus on the life story analyses were among them. Yet these were not direct objection to Mischel's claim—in their core they actually accepted the central core of it.

After the debate, a new frame of personality theory has emerged. Ironically speaking, situationism fosters the integration of psychodynamic theory, trait theory and typology which were all attacked by Mischel (1968). New type of personality theories have eclectically created in the personality related area. New theoretical frame fully depends on a multivariate statistical methodology. One of such a new trend is called the "Big Five" (Goldberg, 1990). One of the representative models of "Big Five" is the OCEAN Model (McCrae & Costa, 1996) which propose five factors including O: Openness to experience, C: Conscientiousness, E: Extraversion, A: Agreeableness and N: Neuroticism. Another theoretical frame is a personality disorder diagnostic system included within the DSM-system. Many personality disorders appear and vanish with hundreds of multidimensional studies.

Even Mischel's claim might directly attack the cross situational consistency and over time stability of personality studies, his claims were supposed to doubt the way of method which are based on correlational coefficients. So relying on the new statistical technique also based on the correlational coefficient (that means SEM) in personality study is no other than the return which longs for cross situational consistency. Furthermore, trajectory focused study in life course study is also based on the correlational coefficient so this is no other than the reversion which blindly take seriously the over time stability.

Recently, McAdams and Pals (2006) tried to release the definition of personality from the old-fashioned "personality as an entity". They defined personality as an individual's unique variation on

1. the general evolutionary design for human nature, expressed as a developing pattern of
2. dispositional traits (the person as actor),
3. characteristic adaptations (the person as agent), and
4. integrative life stories (the person as author) complexly and differentially situated in
5. culture.

From the perspective of cultural psychology, the latter three are enough.

The new look at personality gets rid of the trait concept. Traits—as well as linear and bipolar dimensions—never grasp the transformation of personality. In the "new Big Five" of McAdams and Pals (2006), they didn't refer to the over time stability

of personality based on the rating scale. If they sticked to the notion of over time stability, they were obliged to treat the life course study and it became ruined. Here we find it's time to seek the new type of both theoretical and practical scheme for "dynamics of the living".

Rethinking the Rating Scale: Toward the New Views of Trajectory

Common language terms are usually represented as point-like. A word—"a bird"—despite its various nuances of sense, ranging from anatomical referencing to poetic overgeneralization—is still represented in our speaking or writing by the same form "bird" in a point-like fashion (Abbey & Valsiner, 2004). In case of a point, there is no direction. Vectors have direction and size. But vectors do not cross each other. Vectors are just orientations in some direction. They are not depicting the actual course of development of trajectories, which are essentially combinations of vectors. They depict the development. Vectors are time-free (Table 10.4).

Psychologists who want to measure mental state use the point-scale measurement. It, point-scale, is located within the realm of point. In personality tests, intelligence tests, all questionnaires where you quantify some of the data, time-less and direction-less score is produced. Calculated number has serial order. Increasing and decreasing on the uni-dimensional static scale can be expressed. So point scale orientated research couldn't express the transformation.

Vector models are hybrids of point models and trajectory models. Point models are quantifiable. Vector models can use quantification in estimating vector size. But at the same time they are richer because they use direction which is not quantifiable. You can say how big or how long this vector is but you cannot quantify which way it is oriented. Kurt Lewin wanted to construe field psychology which included vector psychology. But the title of Lewin (1943) paper *Defining the* "*Field at a Given Time*" well reflects his interest is mainly in the field—and not time. It was after the publication of Frank's (1939) cultural–philosophical article on 'time perspectives', Lewin adopted the term (Nuttin & Lens, 1985). He defined it as "the totality of the individual's views of his psychological future and his psychological past existing at a given time" (Lewin, 1952, p. 75). He pointed out the children's narrowness of time-perspective in here and now life space. We can learn from Lewin that vector is suitable for applying the study of space and/or field not for time. So we adopt the different concept of *trajectory* to go step further. The notion of trajectory has been used in life course research—based on correlational relations across time.

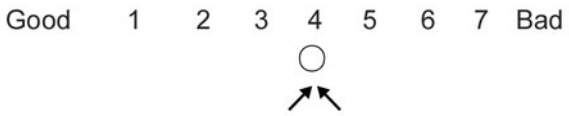
Table 10.4 Point, vector and trajectory on psychological depiction

	Size	Direction	Time
Point	No	No	No
Vector	Yes	Yes	No
Trajectory	Yes	Yes	Yes

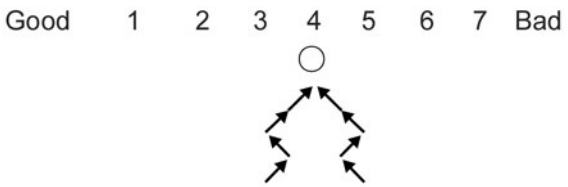
Here we change the meaning of it by comparing with the notion of point and vector. How can one reach the trajectory model from the point model? Imagine someone is asked to rate the life satisfaction on the 7-point rating scale.

The circle on 4 reflects "so-so satisfaction" of the rater. If we are allowed to superimpose (add) the arrow of vector around the score, that makes us understand a little clear.

Someone might depict a trajectory including circle and vectors like this.



The number rated "4" is reached through different directions. This is the simplest trajectory model. Another might depict a trajectory including circle and vectors like this.



This is just the model of trajectory and we can find an equifinality point; to which real and possible trajectory would reach.

Returning to the problem of longitudinal life course studies using psychological scales, the repeated administration of scales only interpret the number on the unidimensional scale. The score might be compared on the dimension of number. But comparison such as this ignores the uniqueness of each person's trajectory (history). Not a score but a trajectory should be recognized if a person is considered as an active, goals-oriented agent. The number observed in a scale is depiction of outcome—while the trajectory is depiction of the process.

Knowing the process make you see what outcome is/can be generated—and not the other way round—from the outcome you cannot reconstruct the process. The point model asks direct questions about phenomena that underlie the "measures"—such as—"what is the '*true state'* of life satisfaction?" This question is impossible in case the vector model is assumed—it would create a method where you are put into some ambivalent situation about being satisfied and observe the *direction of further movement* from that situation. However, the vector model does not provide a developmental and/or historical look on the life satisfaction—since the vector consists of time-based unfolding of sequence of outcomes. A vector is detected by at least two points in some sequence in a space of coordinates.

Developmental and/or historical look need the trajectory model. And trajectory model gives us an enhanced opportunity to explore the complex life history. Surely we agree that trajectories are considered in life-course sociology—yet there they are treated as vectors discovered after the fact, in a retrospect on the life course past. Yet human lives are lived from the known onwards to the not yet known. The methodology of TEM allows us to look at potential and/or unrealized trajectories of both the past and of the possible future. Furthermore, it allows a conceptualization of how the trajectories are in the process of construction.

Considering Trajectories-in-the-Making

TEM: Making the Past, Creating the Future

The Trajectory Equifinality Model (TEM) grows out of the theoretical need of contemporary science to maintain two central features in its analytic scheme—time, and (linked with it)—the transformation of potentialities into actualities (realization). We should start from deductive viewpoint. Of course each person's life trajectory is idiosyncratic. Here is the place where the notion of "abduction" is truly needed. Charles S. Peirce (1908) advocated the importance of abduction as a method of inference in addition to the traditional ones, i.e., deduction and induction. He emphasized that neither Deduction nor Induction contribute the smallest positive item to the final conclusion of the inquiry—all that is done by abduction. TEM depends on systemic view and the view has a greater affinity for the Oriental "inclusive separation"—it is an example of anti-dichotomy logic. It's not a uni-linear process but multi-linear process. TEM can easily depict the variation of trajectories.

Dynamism is expressed by the depicting the social power. Even if there were many alternative options, person wouldn't choose some options. TEM is the hypothetical model of trajectories to a similar experience of equifinality which researchers focused on. TEM depicted from the empirical data might reflect a real abductive inference. TEM is neither the result of inference and nor the result of empirical testing. Such attitude may resonate with the efficiency of model notion by Bruner (1986). He stressed that schema and mental models provide meaning and organization to experiences and allows the individual to "go beyond the information given".

The term *equifinality* is widely known due to Ludwig von Bertalanffy who is the founder of General Systems Theory (Bertalanffy, 1968). We have created a new method on the basis of this notion (Sato, Yasuda, & Kido, 2004; Valsiner & Sato, 2006; Sato, 2007; Sato, Yasuda et al. 2007; Sato, 2009). Sato, Yasuda et al. (2007) emphasized that equifinality does not imply sameness—which is an impossible condition in any historical system. Rather, it entails a region of similarity in the temporal courses of *different trajectories*. The notions of equifinality and trajectory are highly *trans*-related. Simply speaking, TEM is the method to describe persons' life courses within irreversible time after researchers' focusing important events as EFPs. After establishing the equifinality point, trajectories should be traced.

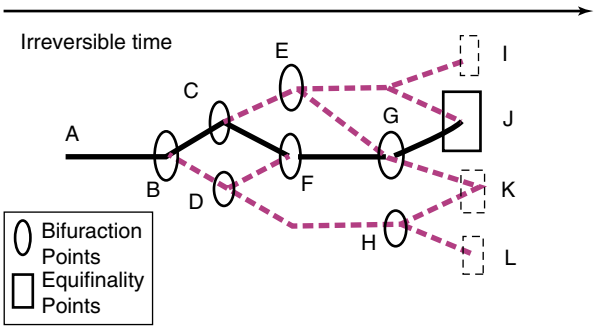


Fig. 10.1 Multilinearity of trajectories (modified after Valsiner, 2001, p. 62)

Depicting the TEM makes it possible to grasp the trajectory with irreversible time (Fig. 10.1).

The rectangle J is the supposed equifinality point (EFP) on what researchers focus on in their researches. For this EFP, there are many pathways to pass. Seven ellipses, indicated alphabetically as "B thorough H", are passage points and many of them have options to go. We call the passage point which has an option as "bifurcation point (BFP)" in this TEM, and have proposed some notions for practicing TEM to construct model (Valsiner, 2001; Valsiner & Sato, 2006; Sato et al., 2007).

Basic Notions of TEM

TEM and HSS. The history of TEM is inter-dependent on the sampling methodology named the *Historically Structured Sampling* (HSS). It is developed in contrast to random sampling—which is highly recommended in psychology because of its apparent "fairness" (randomness). There is a paradox in the use of "random sampling"—it is needed because individual human beings are not homogeneous. As a famous statistician of his day, McNemar (1940, p. 331) insisted that "a large amount of psychological research must depend upon sampling for the simple reason that human variation exists". McNemar regarded the human variation as an "error"—a deviance from the "true value". His view had a lack of historical thinking. He really ignored the historicity of human lives. Human variation is the result of life course of each person and it is not timeless phenomena but time-dependent phenomena.

How should we consider the problem of sampling? If the theoretical implications of TEM are taken as the starting point, then HSS is the necessary sampling tactic to use for the study (Valsiner, 2009). We introduced that concept as a counterpoint to the non-systemic practice of "random sampling" and its less random analogs (Valsiner & Sato, 2006; Sato et al., 2007). This methodology of "random sampling" focuses on persons just because they are assumed to consist of a selected variety of features labeled "variables" (Sato, Watanabe, & Omi, 2007). HSS focuses on the lived experience of any person within the irreversible time. Here, the lived experience should be regarded as true open-systemic phenomena. And all lived experi-

ence is embedded in specific time and place, namely culture. Personality is not a "dependent variable" for the lived experience, but an open-systemic phenomenon.

Thus, the new sampling method should reflect both real life courses and researchers' research questions. We call this new methodology as historically structured sampling (HSS). The notion of HSS entails a radical move from other accepted methods of sampling—random sampling being the most glorified—to a version of non-random sampling of individual cases (Sato, 2007). From the viewpoint of sampling philosophy and technique, the procedure of HSS consists of "equifinality sampling" i.e., the equifinality point which researchers have an interest is the experience to focus on.

Equifinality and Trajectories. Equifinality is the principle that in open systems a given end state can be reached by many potential means. It emphasizes that the same end state may be achieved through many different means, paths and trajectories. Variability of trajectories means richness of life. So the very first place of the conceptual adventure, equifinality and trajectories are highly intertwined with each other.

Bertalanffy preferred *equifinality* better than "goal", equifinality isn't the dead-end like goal point. When the EFP has reached, EFP transforms to a new point to newly emerged finality. Actually, from the view point of research methodology, EFP is the focus point of focus (Y) that allows the different trajectories (1,2,3) to be charted out (Fig. 10.2).

Polarized EFP. Since EFP depends on the researchers focus and/or research questions, EFP only shows one aspect of phenomena. We need to show some kind of complement set of EFP. So we set up polarized EFP (PEFP) for neutralizing implicit value system of researchers. Excerpt from Yasuda (2005)'s study, she approached the infertile experiences of married women in Japan looking at their reconstructed histories of moving between the PFEPs containing "having children" and "not having children" as the two opposites within the same whole. Both having children and having no children should be considered as equivalent equifinality points.

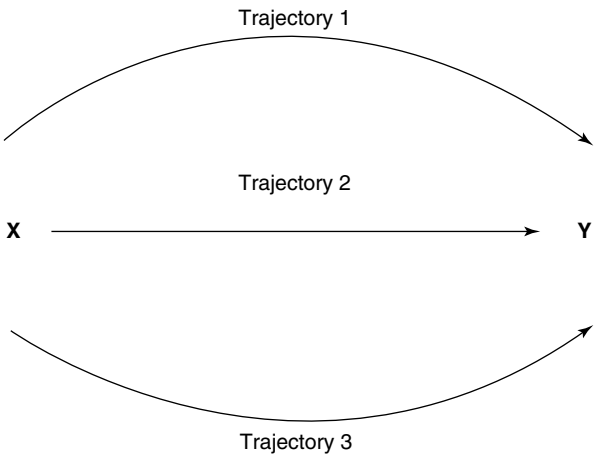


Fig. 10.2 Equifinality point as a result of three trajectories

Irreversible Time. Under the influence of Bergson's philosophy, Valsiner (1999) insisted that the irreversibility of time is an absolute given for the study of all living phenomena. Irreversible time is the characteristic of real time never to repeat any happening of the previous time period. Time flows from an infinite past towards an infinite future. We don't intend to refer the representation of time. We try to put the basic feature of time into our model. Even if we felt we do same things, time might pass. There is no timeless repetition, we pose.

BFP and OPP. Bifurcation point (BFP) is a point which has alternative options to go. Obligatory passage point (OPP) is a concept originally emerged in the context of the geopolitical term (Latour, 1987). For example, the Strait of Gibraltar is the strait that connects the Atlantic Ocean to the Mediterranean Sea. So we can say that the Strait of Gibraltar is the OPP from the Atlantic Ocean to the Mediterranean Sea, and vice versa. Converting it in the context of TEM, OPP means a phase and/or event persons inevitably experience through initial condition to EFP.

Multifinality and ZoF. Multifinality simply implies the multiple-ness of finality. But in the meaning sphere of TEM. It is used for finality after EFP. This means that multifinality refers to various pathways and finality from the same beginning point. In the context of TEM, multifinality implies the diversity after the points of EFP or polarized-EFP. And the different view point, EFP is set by researchers. Even researchers might focus on the EFP from their own research interest, each participant has their own life and finality (aim and/or goal). In their paper on the prevention of HIV/AIDS, Mitchell, Kaufman, and Beals (2004) showed the utility of focusing the variation, they examined multifinality (looking prospectively) and equifinality (looking retrospectively) to identify both normative and less common combinations of risk/protective configurations. We use the *multifinality point* when the finality after EFP is clear. But if not, we use the term *Zone of Finality* (ZoF- Fig. 10.3). Zone of Finality (ZoF) is the finality of participants after the EFP. EFP derives from the researchers' insight rather than participants' landscape of the aim and/or goal. ZoF might compensate the complacency of researchers. The reason

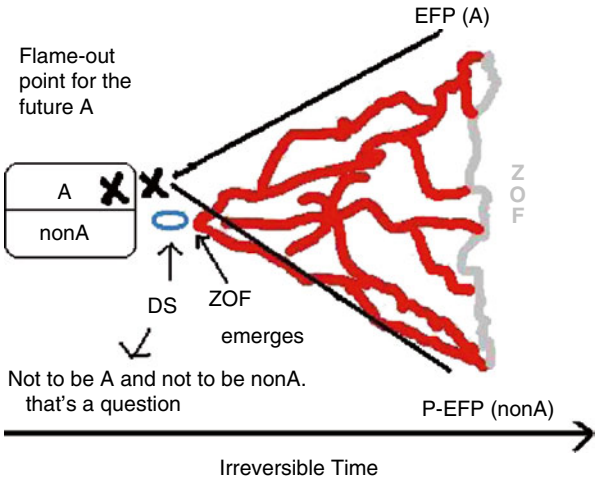


Fig. 10.3 Zone of Finality (ZoF)

we use the ZoF in place of multifinality is that the future perspective might be ambiguous itself.

Social Direction and Social Guidance. The focus on social direction derives the notion of directed social cultural power. It might be said that the "common sense" provides tradition, social norm and social pressure. On the other hand SG is the power of defense against the social direction. SG is the power supplied from the intimate persons such as a family, friends, teacher and others. Simply speaking, SD is defined as the power of inhibition to go to EFP, and SG is defined as the power of promotion to go to EFP.

Transformation of an Open System. TEM is a tool for depicting both real and imaginary trajectories to equifinality points and it doesn't include the tool of depicting the state of each person as an open system on a trajectory. An open system sometimes transforms and almost maintains it. We consider that maintaining is the form of transforming. To trans-form implies changing of form, i.e., some form of the previous kind turns into a new form (Fig. 10.4). So the number generated by quantitative measures cannot depict the whole process of transformation.

Transformation involves something becoming something else. That is one aspect of development. Whatever is there before becomes transformed into something else. Secondly, whatever is there before maintains itself. So also that maintenance, the steady state of developing organism is also developmental phenomenon. This will be particularly crucial in autism. Autism is a domain of very slow development. You have to wait for a long time and for very good circumstances when the autistic child would break out of the cycle of autism.

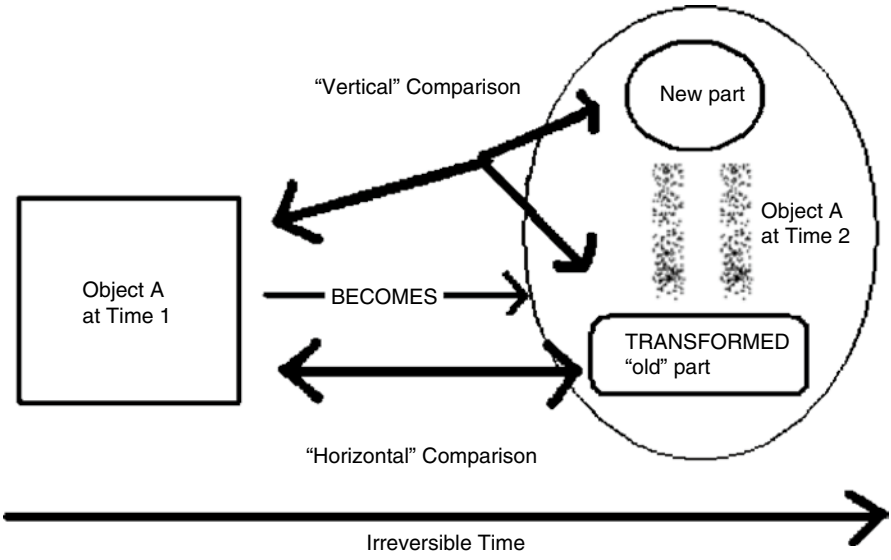


Fig. 10.4 Transformation of form (modified after Valsiner, 2001)

Empirical Studies for Depicting Dynamics with TEM

Because the methodology of TEM has only a brief history, there are not so many studies using TEM till today. But we can show a list of leading TEM studies.

Life events studied with using TEM are neither abstract experience nor abstract psychological process. These are the lived experience embedded in culture within irreversible time (Table 10.5). For example, abortion is a highly cultural-historically values-laden event. Some cultures never allow the abortion today. In Japan the abortion operation is restricted before 22-week gestation today but was allowed 8-month before. Similarly, becoming psychologists in Estonia in 2000s (Kullasepp, 2006) may be different from becoming one in other country. And again, aiming to get married in Japan in 1980s (Tanimura, Sato, & Tsuchida, 2008) are desperately different experiences of Japanese women in 21st century. All these are dramatic real-life experiences. Yet nothing can be more misleading in science than abandoning the general view on the quality of the whole as it relates with its parts (Valsiner, 2009).

Here we show an example of the TEM study on the dropping out from the higher education.

Following Sato et al. (2007), Cortés (2008) reviewed the steps in using TEM (Fig. 10.5). These are: (1) defining relevant equifinality regions (EFR) and Obligatory Passage Points (OPP) in the map of trajectories of the process, (2) empirical mapping out all cases moving through these points, and (3) comparison of actual trajectories as these approaches to the equifinality region. Extending the original focus, Cortés (2008) proposed the equifinality "regions" instead of equifinality "point", because the notion of regions hints the geography and/or place. So a region goes together I-"positions" of Dialogical Self (DS; Hermans, 2001). Cortés tried to integrate TEM and Dialogical Self. He defined two polarized equifinality regions—"I as an educated (higher education) person in X field" and its opposite polarized I position, "I as a non-educated (higher education) person".

The strategy for construction of the TEM presents two related levels of organization of the dropout phenomena: an ontogenetic level to depict different possible trajectories with dropout events in the aim to construct the web of historical trajectories of individuals and a "quasi-microgenetic" inquiring level by focusing the previous moments of dropout events that lead the dropout decision and the consequent decisions and what happened after the decision.

Table 10.5 Studies using TEM

Reference	Topic
Yasuda (2005)	Giving up the infertility treatment
Kullasepp (2006)	Becoming psychologists
Kido (in press)	Wearing makeup habitually
Cortés (2008)	Dropping out from higher education
Yasuda et al. (2008)	Adolescent abortion
Tanimura et al. (2008)	Japanese women aiming to get married before 26-year-old

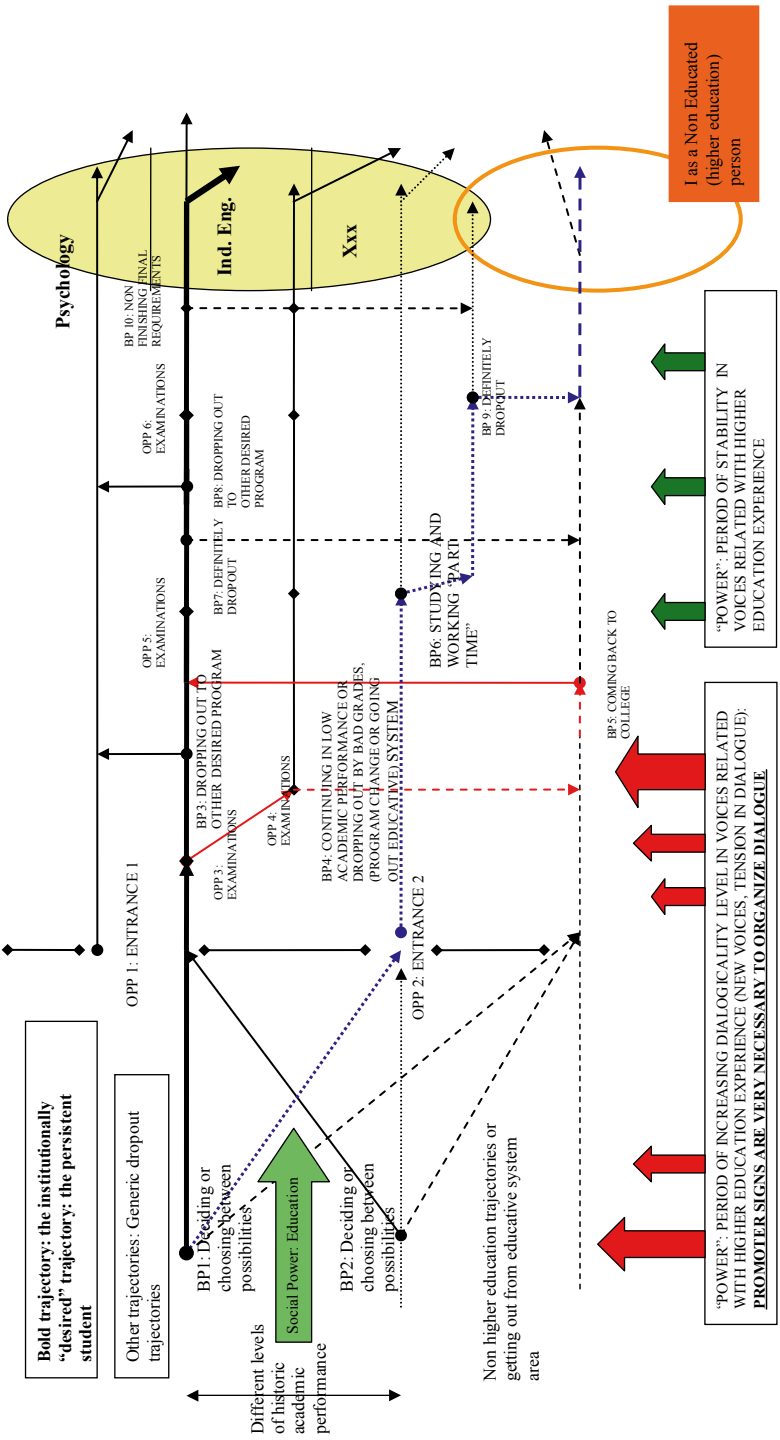


Fig. 10.5 Cortés (2008)'s TEM

The act of using the HSS and TEM involves the following steps (Valsiner & Sato, 2006; Sato et al., 2007):

(A) locating the relevant equifinality point (EFP)—as well as all relevant OPPs—in the generic map of trajectories necessarily present for the generic system of the processes under investigation (theoretically based activity),
(B) empirical mapping out all particular cases—systems open to study that move through these points, and
(C) comparison of different actual trajectories as these approach to the equifinality point by superimposing onto each trajectory a pattern of theoretically meaningful "range measure"—derived from (A)—that specifies whether the given trajectory fits into the realm of selectable cases.

Since EFP depends on the researchers focus and/or research questions, we have proposed to set up polarized equifinality points (PEFP) for neutralizing implicit value system of researchers. PEFP makes researchers notice the possibility of invisible trajectories. Preparing the questions is an important procedure to do qualitative study including TEM. For example, AyAe Kido focused the experience of "Wearing makeup habitually" and interviewed 5 females. Questions made are 7 items in three categories.

The participant's immediately close female person such as mother, sister and the others were asked about the way of makeup style that they use them, the attitude for makeup they take, and whether the participant long for a way of makeup of them or not.

The participants were asked about when and how were they passively worn makeup first time, hen did they wear makeup spontaneously first time, And when hen did they were makeup habitually in life? General questions includes items like what does the makeup mean for them at that time?

All contents of the interviews were recorded with permission. The records of all interviews were divided meaningful sentences units for further analysis. One unit might consist of a sentence or sentences. Japanese scholars sometime use the KJ method. KJ method developed by a Japanese ethnologist, Jiro Kawakita in the 1960s (Kawakita, 1986). The KJ method was developed as a result of having difficulties in interpreting ethnographic data in Nepal. The KJ method builds upon Charles S. Peirce's notions of abduction and relies upon intuitive non-logical thinking processes (Scupin, 1997). Each unit (sentence) written on card is to be categorized step by step. First, exact same expressions in units are compiled. Almost other units are left. Second, similar expressions in units are compiled and are given some abstract label that characterizes gathered units (i.e., new unit emerges). Some units originally and new units emerged in second step are now materials for next step of compiling. Compiling and labeling procedure is conducted repeatedly (usually 4 or 5 times) so that abstract and/or aggregated categories might appear. These repeated compiling procedure results in getting different level of abstract labels. In Kido's case, all relevant events and facts of cosmetic experiences are written on individual cards and collated. Kido ended up with four categories from her interview data. For TEM, the highest level of categories is not needed. Moderate level of labels is needed to depict trajectories (Kido, in press; See also Sato et al., 2007).

Focusing on the Dynamics in the Personal Decision Making

We need a further step to describe the dynamics in human development. The theoretical issue to consider is like this. Mori (2009) expresses the concern that TEM expresses just the superficial sequence of events, not the dynamics of human experience. What happens at the specific decision making point to determine which way she/he take? To explain the mechanism around the BFP (Bifurcation Point) appears to be necessary for understanding the dynamics of the livings within irreversible time. After reaching BFP, for example, circle c in this figure, if there are two or more concrete finalities, these are called as multifinality. And if not so concrete and only the ambiguous image is seen, such a situation may be better to be called as the Zone of finality. Each person on the own trajectory has his/her orientation which has developed through the life course. We call this orientation as "Synthesized Personal Orientation (SPO)". SPO takes forms of goal, adoration and dream.

As usual, SPO automatically leads to next finality. But sometimes, objections and/or barriers might happen. This is the point of severe decision making. We can assume here two powers are simultaneously at work at the point. These are social direction (SD) and social guidance (SG). Both SD and SG are conveyed through everyday social exchanges at home, school and other social situations. And relative gravity (direction and power) of SD and SG determine the selection.

Significant others may play different roles in this scheme. They sometimes stand with a person as an agency of SD (for example, a social norm) and sometimes guide a person from the power of SD to reach solution (making decision). Because, there are many significant others around one person—like a convoy attempting to persuade him/her in one or another direction. From the theoretical view point, there are many bifurcation points to make decisions about moving along one or another of the trajectories. Seeking the decision-making points doesn't inevitably need the EFP. Instead, analyzing powers around the decision making points allows TEM research broader perspective than before.

Then we look closely the transition process between c and a in Fig. 10.6. As we say later, we can conceive this transition process by using three layers model of genesis (TLMG).

What would happen at the one trajectory from a point (see in Fig. 10.7) to another point a? In the figure before (i.e., not this one), the lines between points are straight and direct but if looking at closely, we can see the two opposite powers which conflicts between social direction and social guidance. So the Synthesized Personal Orientation (SPO) reflects the fluctuated orientation and open-systemic nature of human being within irreversible time. A person proceeds with one's orientation as an open system (which means orientation is not internal derived) and struggle to realize own orientation against the social directions (SD) with support of social guidance (SG) supplied by the intimate social relationships.

For example, before World War II, Japanese university did not open their doors to women. So if some women hoped to go study at university, social direction strongly suggested not to study. But of course, universities of other countries such as in the US opened the door to women around that time without restrictions. Ms. Tsuru Arai

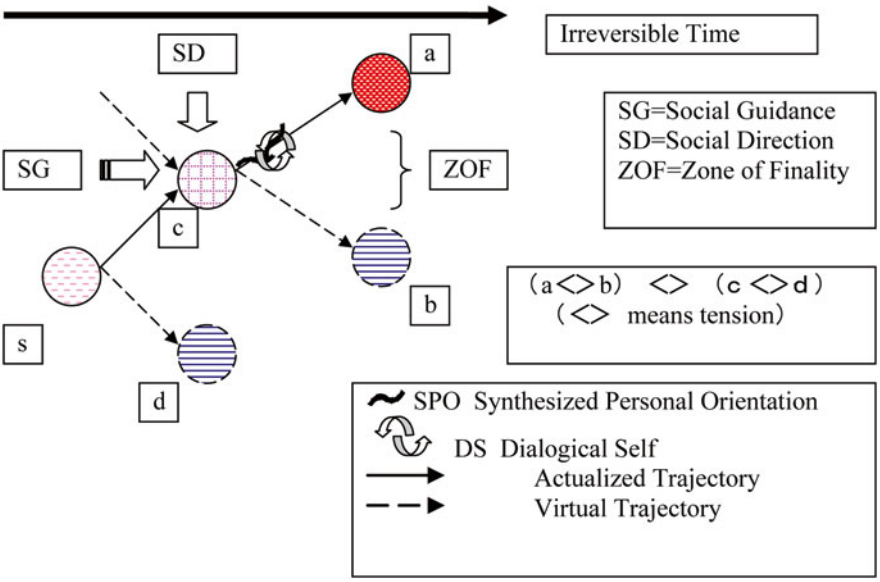


Fig. 10.6 Social guidance and social direction

(1886–1915) entered graduate school of Columbia University and was supervised by Edward L. Thorndike. She could earn Ph.D. Degree in 1912 (Sato, 2007). In her life situation her family and teachers encouraged her much to go study abroad. Thorndike in graduate school of Columbia also encouraged and supervised her.

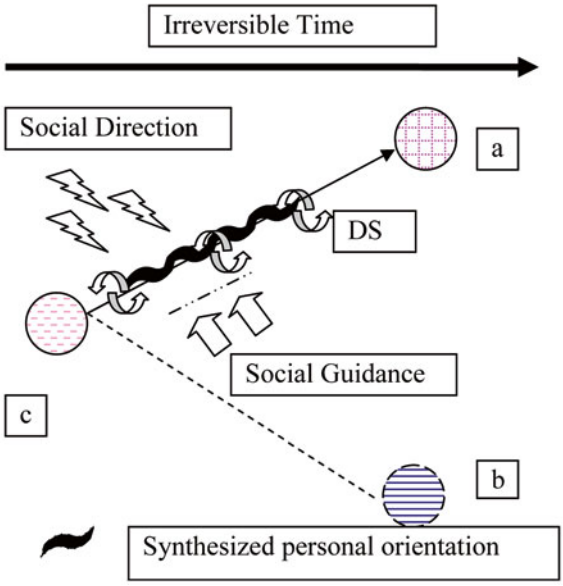


Fig. 10.7 How dialogical processes construct trajectories

Traditional psychology has easily attributed outcomes of positive development to single causal factors, such as motivation, while the term "social support" tends to be used to explain the social relationships needed to overcome the bad condition. But such explanation by motivation is not appropriate for open-systemic view—by which the achieving person is constantly relating with the environment. Dialogical self emerges when synthesized personal orientation fluctuates. Inspired by both William James' American pragmatism and Mikhail Bakhtin's Russian dialogical orientation, Hubert Hermans created a theory of self on a new basis—the unity of opposites involved in a dialogue. The dialogical self theory presupposes a multivoiced person with not just one dominant I-position, but several I-positions, which are temporally and spatially structured (Hermans & van Kempen, 1993). The self is defined as a "dynamic multiplicity of relatively autonomous I positions in an imaginary landscape" (Hermans, 1999).

Temporally and spatially structured "I-positions" have different voices and "I-positions" are relatively independent each other. But in some points, they cause conflicts. Thus, "I as a" and "I as b" appears by turns and conflict occurs. Back to the Ms. Tsuru Arai of about 70 years before in Japan, Tsuru as a non-educated and Tsuru as an educated girl might cause conflict. This scheme can really represent the superficial calm but deeply dynamic process on the way from one BFP to another point (before making decision).

The Three Layer Model of Genesis (TLMG—Fig. 10.8) is useful for understanding ontogenesis through the prisms of two other time frames (Valsiner, 2007). At the lowest level, micro genetic level, the process of *Aktualgenese* (this German word was translated into English "microgenesis" by Heinz Werner) is constantly at work. But in macro genetic—that of ontogenetic—level nothing needs to change. It is in between the two levels—the mesogenetic level where changes are consolidated to be either taken as novelties to the macrogenetic level, or become regulators ("promoter signs") of the microgenetic processes. Ontogenetic maintenance can happen through SDs (social direction), the promoter sign can be derived from a social norm, habit or any conservative tendency.

Setting equifinality points (EFPs) lead to put both potential trajectories to EFP and polarized EFP (PEFP) on the trajectory. But of course this is the demand for researchers not for participants. Sometimes people cannot do anything because selection is difficult (Hamlet or Buridan's ass phenomena). But the other time, even after selecting one option, people bother. Here we can see that the Dialogical Self

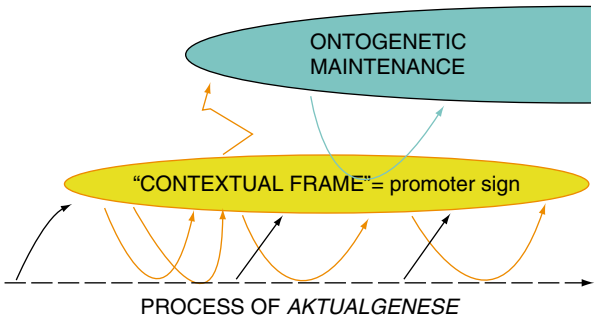


Fig. 10.8 The scheme of three layers model of genesis (TLMG)

is useful again. That is, bothering persons have dialogue with themselves. What if I had selected another option? How I would be now? This form is easily converted into another form with dialogical self. Which is better for me now, I as one or I as another? For example, two choices of university A and B for a person, s/he self-dialogue is I as a student of A university better than I as a student of B university? There are many more severe choice situations. We move to the situation of intractable disease patient to think about more severe decision making process.

General Conclusions

A person is not the pile of traits and a life trajectory is not a single line connecting the discrete time points which researchers arbitrary set. If we take time seriously, we should not say such things. There exist many obstacles to our efforts to take time seriously in studies of psychology and sociology. Uses of stage theories and reliance on correlation coefficients, as well as an implication that trajectory is merely a unitary path (rather than a range of options) within the life course paradigm that we outlined in the beginning of this chapter are some examples. Taking the equifinality principle into account is one of the breakthrough in describing the dynamics. Accepting the premise that different initial conditions produce different trajectories to arrive at a similar final state is the reality of open systems.

The Trajectory Equifinality Model (TEM) hopefully overcomes such obstacles. The dynamics of living in real context should be understood by using the notion of signs as organizers of the future—hence assuming a constructionist stance. Vygotsky (1978) pointed out that the developmental process is mediated by cultural tools. Human development is mediated by signs—and because of such mediation the potential for a person's moving in various directions in one's life course exists. Life stage models of development cannot conceptualize this dynamism. Of course, existing life course studies struggle to understand the continuity of life as well. But they can never depict the dynamics of the flow of the lived experience within in the irreversible time. They might cover outcomes of processed that are charted over time—creating a trajectory *post factum*—but never accessing the real processes embedded in time. Actually, the practice of life course research sets up longitudinal "contact points" at fixed intervals—yet relevant transitions can happen at any moment in between these points. To use an analogy—model of life course studies look like fixed net fishing. In contrast, TEM is one of the ways to understand the flow and the continuity of life from the view point of the agent whose life course is under study.

Last but not least, we consider the notion of transform within our discussion. We need the transforming mechanism model which leads to depict the dynamic process of life trajectories. Depicting the maintenance of a similar state is also dynamic. Superficial maintenance never implies static state of covert system. Sometimes covert dynamism might result in the overt static state. Looking at the trajectories as they are being constructed can be used for creating the new way to depict the coherence, dynamism and variation of idiosyncratic life within irreversible time.

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