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TOWARDS MODELLING OF HUMAN RELATIONSHIPS

NONLINEAR DYNAMICAL SYSTEMS IN RELATIONSHIPS
TOWARDS MODELLING OF HUMAN RELATIONSHIPS
Nonlinear dynamical systems in relationships

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Abstract

This study fills an urgent need for qualitative analyses of relationships resulting in human change. It is a result of sixteen years of independent study by the author. It combines postgraduate study of nonlinear methodology, applied research of children’s pretend play, experience in educational psychology and Gestalt-counselling, as well as the practical training of graduate students at the Karelian State Pedagogical University (Petrozavodsk, Russia), and the Kajaani Department of Teacher Education (Kajaani, Finland).

In this thesis, an attempt is made to reveal the fundamental reality of relationships between human beings. Using theories of helping relationships and data from developmental psychology, a qualitative nonlinear dynamical model of human relationships is elaborated. The scientific findings of Kurt Lewin and the Gestalt-therapy theory are widely used. To illustrate the explanatory potential of the proposed relationship model and the possibility of qualitative analyses, children’s pretend play is analyzed.

In the first chapter, the basic connectedness between humans is studied. The author is focused on theories of relationships and their application to the organizing of relationships’ flow. The second chapter is devoted to detailed analyses of dynamic features of these theories and Kurt Lewin’s conception of tension system. The ontological philosophy of relationships is briefly reviewed. This helps to formulate the main problem of the research – how is a nonlinear phenomenological model of human relationships possible? In the third chapter, a new nonlinear dynamic model of human relationships is elaborated. Several conceptions from Lewin’s dynamic psychology and Gestalt-therapy are further developed in the model. A number of examples are analyzed. Video-data on children’s pretend play is analyzed in the fourth chapter. In the subsequent discussions some advantages and shortcomings of the suggested dynamic nonlinear model are examined.

Keywords: intention, metasystem of self, nonlinear dynamical system, phenomenological modelling of relationships, psychological force, relationships
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Asiasanat: ei-lineaarinen dynaaminen systeemi, intentiot, minän metasysteemit, psykologiset voimat, suhteet, suhteiden fenomenologinen mallittaminen
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Introduction

In many professions, such as education, social work and health care, communicative competence is important. Representatives of these professions may have a long-term influence on human development. Teachers in Finland, for instance, spend more than 10000 hours with each student during their school life. Attempts to influence other people are made in other professions, as well. In their work teachers focus on different aspects of interaction

- To address a subject
- To achieve results expressed in the curriculum
- To comply with rules and ethical principles in relationships

Nevertheless, many teachers lack communicative competence. For instance, in some Russian kindergartens and schools, the teachers’ attitudes towards children cause didactogeny (Zuckerman, 2000). This is a neurotic disorder, often called “school neurosis”, resulting in students’ unwillingness to attend kindergarten or school. It appears as a result of the teacher’s improper communicative interventions. The teachers often force children to live up to expectations as regards what a student should do and know owing to curriculum prescriptions. Thus, the teacher rushes to reproduce a lesson and to get the expected results.

The same problem is known in the EU, too. The teacher often withdraws from constructive contact with the child, because proper elaboration of relationships is difficult. This lowers academic expectations and, thereby, educational results. It is possible for a schoolchild to pass to the 7-th grade without learning the concept of time, simply because the school has decided to allow him to pass in order to avoid a conflict with him.

On the other hand, there is too little space for professional performance in order to support the child’s development. The main questions in teachers’ everyday practice are

- What shall I teach?
- How shall I teach?
- What will be the result?
- How should I evaluate the results?
- How can I eliminate disturbances while teaching the subject?
- How can I observe ethical principles while teaching and be nice to colleagues and children?
In a teacher’s daily work one permanent contradiction has to be solved. On the one hand, the child’s development is based on the relationship between teacher and student. This argument is based on the famous “genetic law of cultural development” and elaborated in the concept of the Zone of Proximal Development (ZPD) (Vygotsky 1978). According to these ideas learning leads to developmental changes at the first stage of social interaction and later as internalized psychological functions. On the other hand, subject matter teaching and/or obeying formal principles of school life takes most of the teacher’s time. No time is left for developing proper social relationships between the teacher and students, which are necessary for the cultural and psychological development of children.

Some educators are aware of relationships as significant professional tools. But relationships are supposed to be a pre-given natural tool in attaining educational and social results. Knowledge of the process of relationships in general remains unclear. Helping relationships often miss the teacher’s attention. At best, the teacher organizes relationships as a chain of steps. If the teacher cannot anticipate the next step, s/he uses their own creativity or avoids further contact.

Relationships either as a natural pre-given tool or as a chain of steps both represent atomistic understanding. A human being is situated in the world like Robinson on an uninhabited island. It is a “Gnoseological Robinsonade”, a pure Cartesian viewpoint that a human being possesses “sovereignty and fullness of possibilities of isolating and cognizing mind” (Kagan et al. 1998, 36). It is argued that each human being is initially isolated from others, and humans are connected somehow by elusive, mostly verbal relationships and contextual agreements.

Consequently, some differences in the understanding of relationships in school education and in family life provoke us to think that family and school relationships are different in general. This compels children to switch daily from family to school and back “like jumping from planet to planet” (Grant 1989, xii). The illusion of Cartesian isolation forces educators to make additional efforts to approach different planets, or different Robinsons from various islands. However, overcoming the Cartesian illusion of isolation in relationships falls outside the educator’s professional competence.

Another prevailing view about relationships in social sciences presents an opposite argument – loss of related Robinsons themselves for the sake of relationships (Wheeler 2000). By paying attention to relationships between mother and child as they are (Fogel 1993; Fogel et al. 2006), makes it possible to
find some clear dynamical characteristics. The dialogical self arises from mother-infant relationships. Modern nonlinear methodology is necessary in the analysis of relationships (Fogel et al. 2006). But the self has no reference frame of its own. In opposition to isolated Robinsons, there are unclear personalities and their coordinates and some specific paths “through the ocean” between “the islands”.

This scientific position shares some similarities with the social psychology of daily life. For instance, according to the attribution theory (Heider 1958), people in daily life attribute their own success or failure differently, than others, making fundamental attribution error (ibid.). A common feature of these approaches is in their passive attitude to relationships. People relate as they do, and scientific explanation is presented ex post facto. There are neither general notions of relationships nor possibilities and intentions to organize them. This is a version of the positivistic approach to relationships research and its problem is passivity of relationships. This results in low responsibility for partners. It often draws researcher’s attention away from the inevitable influences on relationships.

The professional organization of relationships started with helping relationships. This is an area of professional activity with a focus on the organization of relationships (Rogers 1961; Bugental 1987; Perls 1973; etc). Focusing on relationships in helping professions appears to be a complementary event to the Freudian atomistic conception of man. The modern approach to psychotherapy and counseling has elaborated connections between theoretical and practical experience in organizing life-changing relationships (Bugental 1987). There is a wide spectrum of conceptual systems, practical knowledge and scientifically proven results from helping people to improving themselves and to learning more from life, getting expected results (see, for instance, Nelson-Jones (2005)). Each approach suggests proven methods of organizing actual relationships, helping people to understand one another and attaining the desired changes. Psychotherapy, counseling and social work practice have been the source of experiential knowledge for over a half-a-century already. Professional training in helping relationships lasts for years and is toilsome. It demands total involvement on the part of the trainee and includes the risk of irreversible change.

It is obvious that the transfer of professional knowledge about relationships from psychotherapy to education is not an easy task. A teacher starting on a helping relationships training program is similar to Darwin just landing on the Galapagos Islands: he finds so many unknown species that he begins to doubt the consistency of his evolution theory.
There is another, maybe more serious problem; the lack of scientific and practical interest in helping relationships in educational institutions. The use of different conceptual systems and specific tasks reveals this. Conceptual and practical differences between the approaches are clear only for skilled practitioners. The real professional mastery of using helping relationships is attained after a long training, at great expense and high motivation. Teachers often do not have the possibilities to reach such a professional mastery.

It is possible to suppose that educational research has these phenomena as research object and has solved the problem how to organize relationships at kindergarten and schools effectively. However, in reality, scientific knowledge is fragmented and developmental tasks are uncoordinated. There are no rigorous scientific methods to solve the problems.

We can formulate the problem of relationships in education as follows:

Relationships between a teacher and a child play a key role in a child’s learning and development. However, the focus of professional efforts is on teaching subject matter, performing a program. Teachers do not pay attention to the effects of their relationships in the course of their professional activity.

Teacher-student relationships as such are combinations of teacher’s interventions, student’s tendencies of self-development and fragments of dialogic relationships with children. Teachers are not aware how they should help children to develop through relationships, because they do not know how other professions use helping relationships, and this knowledge is not included in teacher education programs.

Why does the problem exist?

We may suppose that different schools of social sciences, especially psychology, psychotherapy and social work understand the problem in a different way as their initial views on human development and change are different. There are scientific efforts to synthesize different approaches in psychology, psychotherapy and social work. For instance, methods and tools of integrative psychotherapy, attempts to integrate qualitative and quantitative research methods in social work manifest the urgent need for a generalized phenomenological understanding of human affairs.

There have been quite a few attempts to develop a common scientific language or to construct a model of relationships for solving psychological and educational tasks. Some attempts of Gestalt psychology (Goldstein 1995; Lewin 1935; 1936; 1938; 1951; 2001; Wertheimer 1945; Zeigarnik 2003) or of modern
psychological schools (Csikszentmihalyi 1975; 1991; 1993; Fogel 1993; 2006; Marks-Tarlow 1999) are close to the phenomenological modelling used in “hard” sciences (Morrison & Morgan 1999). Various discussions on the theoretical issues of helping relationships (Dilts 1994; Perls 1969a; 1969b; 1973; Bugental 1973; Zinker 1977; 1994; etc) also manifest trials of using phenomenological modelling.

**How to solve the problem?**

We suppose that the solution can be found in a phenomenological modelling of relationships. Kurt Lewin’s generalized phenomenological concepts (Lewin ibid.) were based on up-to-date scientific worldview, on knowledge of classical dynamics in physics and mathematical topology. Unfortunately, his efforts and phenomenological way of thought were not properly understood. In spite of regarding Lewin as “a father of social psychology”, modern social psychology uses predominantly quantitative research methods. Academic psychology has ignored his dynamic theory of personality. For instance, his fundamental idea about one case study in search for manifestations of psychological laws is rarely mentioned. But in the study of helping relationships his ideas have been accepted. Modern Gestalt therapy, for example, uses phenomenological thinking, analyzing relationships on the basis of Lewin’s field theory (Ginger & Ginger 1999; Lebedeva & Ivanova 2004; Parlett 1991; 1997; Polster 1995; Zinker 1994; etc).

Further elaboration of the phenomenological model of relationships can solve the problem of a generalized notion of relationships in education, social work or other professional communication. Kurt Lewin has laid a classical scientific foundation. Gestalt therapy developed the phenomenology of relationships relying on this foundation (Clarkson 1989; Lebedeva & Ivanova 2004; Perls 1969a; 1973; Zinker 1994; etc.). It is necessary to go further, and develop existing models of relationships in other domains, using modern methodology.

However, the generalized notion of relationships will not help much if the linear view of relationship is not replaced. The current situation in education is reminiscent of the appearance of social opinions on accidents. If someone breaks the law, the media discuss the symptom bearer and his/her family. If a child does not succeed in school, the teacher looks for a specific cause in the child or in his family. If a child, in contrast, succeeds, then the teacher thinks that the success is a result of his teaching efforts. In mechanical analogy, the impulse of a teacher moves the student. Even if this linear chain of steps will result in a unified phenomenological description, it will only increase the discordances of linear
thinking. It is not obvious that in real human relationships the connections are built up linearly.

A scientific view on helping relationships reveals that subjective change and developmental relationships are possible as a result of growing self-awareness and self-responsibility. In the study of helping relationships human beings are multidimensional systems of high complexity. They are multi-structural and multifunctional psychosomatic organisms that behave according to their free will and produce unpredictable nonlinear responses. Man-in-the-world is rather a self-aware and self-sufficient open dynamical system. Relationship with the world and other people is indivisible from the deep internal processes in human beings. Interaction organizes relationships and fulfills the entire relational field simultaneously. One influence entails billions of synchronous processes and sudden changes in man, depending on self-regulation. Replies to intervention are partly or totally unpredictable. Subjective changes are sudden and unpredictable for the external observer. The human being’s choices are, sometimes, totally beyond the observers’ abilities to understand. Relationship process flow is nonlinear and the external observer cannot control it (Bertalanffy 1979; Capra 1996; 2002; Knyazeva & Kurdyumov 1992; 2007; Marks-Tarlow 1999; Parlett 1991; 1997; Perls 1969c; Watzlawick et al. 1967).

Similar nonlinear effects are observed in kindergarten and school education (Poddiaikov 2000; Zuckerman 2000), and in developmental processes (Cole & Cole 2005; Slobodchikov & Zuckerman 1996; Vygotsky 1984). Therefore, in addition to the phenomenological view, it is necessary to elaborate a nonlinear dynamic model of relationships, which implies a nonlinear way of thinking and action (Clarkson ibid.).

This study is devoted to elaborating the phenomenological nonlinear modelling of human relationships. The central research question is:

How a phenomenological model of relationships, based on nonlinear methodology and helping relationships, is possible?

The answer to the problem is presented in the subsequent chapters in the following order.

The first chapter is devoted to the analyses of relationships conceptions with different methodological backgrounds but common dynamic phenomenology.

The second chapter specifies the important dynamic processes in some of relationships theories presented in the first chapter. We focus on significant
dynamic characteristics and constituents of relationships, usually unaware. At the end of the chapter, the research problems of this study are specified.

In order to elaborate the unit of analysis for relationships the nonlinear model of relationships is developed in the third chapter. The transition from linear to nonlinear view, from the Aristotelian to the Galileian mode of scientific thought is elaborated.

The fourth chapter is devoted to the analyses of empirical data.

The fifth chapter presents the results of the research, which provide answers to the main research question and problems. The sixth chapter offers a short discussion while the conclusions are presented in the seventh chapter. The appendices include a detailed list of definitions and a tool for relationship analyses in the form of a table.
1 The psychological phenomenology of human relationships

Human relationships make human society possible. It is impossible to imagine a healthy human being totally without relationships. There is no way of studying human change without its connectedness with others. Professional relationships embrace a large area of communicative professions. There is no doubt that healthcare, education, social work and counseling, and business and management are among them. Theoretical and applied knowledge of relationships is elaborated in social psychology, education and psychotherapy and counseling. In their turn, they derive inspiration from methodological achievements of fundamental theories, including ontological, hermeneutic, constructivist ideas of philosophy. It is difficult to find the most important connections in the whole of the multidimensional complex net. However, it is possible to focus on ties that support the human developmental change.

Our main approach in observing and describing relationships is phenomenological (Abraham 1995; Arnold 1990; Bugental 1987; Fogel et al. 2006; Guastello 1987; 1995; Haken 1996; Hartmann 1999; Kelso et al. 1993; Lewin 1935; 1936; 1938; 1951; 2001; Marks-Tarlow 1999; Maturana & Poerksen 2002; Maturana & Varela 1973; Morrison & Morgan 1999; Perls 1969a; 1969b; 1973; Perls et al. 1951 (1980); Prigogine & Stengers 1980; Varela 1996; Zinker 1977; 1994; etc). We focus on generalized notions of human change connected to the flow of relationships. Therefore, it is necessary to avoid a “sharp distinction between practical, theoretical and research orientations” (Cole et al. 2005, Preface). In contrast to the phenomenological modelling in so-called “hard” sciences (Arnold 1990; Hartmann 1999; Morrison & Morgan 1999; Prigogine & Stengers 1980), the “soft” modelling in the psychology of relationships comprises descriptions of experience and awareness dynamics. Lewin did not pay much attention to concrete features of age or cultural situation when he described deliberate action dynamics through consequent phases, or looked at motivational dynamics (Lewin 2001; Zeigarnik 2003). He focused on the general phenomenology of the tension system (ibid.). We will focus in this study on a general phenomenology of relationship process between participants aiming at their change just as theories of helping relationships did. In any theoretical or practical inclination of examined knowledge, concrete features of personal change are subjected to a phenomenological view. For this reason, we will consider, for instance, the concept of Zone of Proximal Development (ZPD), proposed by Lev
Vygotsky in a narrow context – as a definition of ZPD (Veresov 2004). In this study we explore similarities between the phenomenology of the flow of relationships and modes of collaboration in educational, psychological and other domains.

1.1 Human relationships and change

1.1.1 Developmental psychology and ZPD in developmental change

There are four central questions of developmental science, as it has been pointed out by M. Cole:

- continuity
- sources of development
- plasticity
- individual differences (Cole 2005, 7)

These questions are based on the Vygotskian cultural-historical theory of human development and Cole’s empirical research work.

It is possible to reformulate these questions using the relationship perspective. The first question, the continuity of individual development includes two interconnected characteristics of developmental flow; qualitative and quantitative changes. Long-term developmental changes are usually described as stages.

Cole explains stages of development using four criteria suggested by J. Flavell (cited by Cole ibid. 9–10): changes are qualitative, simultaneous in many factors, rapid, and form coherent patterns. Cole gives an example of walking which occurs parallel with the child’s pointing at things, an ability to follow the gaze of another, appearance of “first words and new relationships between children and their parents” (ibid.). What is important for this study is that new patterns are main indicators of qualitative changes in development.

The questions about sources of development and plasticity are the closest to relationships. Sources of development, by Cole, depend on how genetic heredity and environment – “nature” and “nurture”, – contribute and interact in developmental change (ibid. 10). Nurture involves cultural and social influences on the development, which are possible by means of mere relationships. Plasticity involves Vygotsky’s critical periods and sensitive periods of development. Only a child’s individual manifestations indicate originally critical periods of
development (Vygotsky 1984). Cole emphasizes social facilitation of the developing child’s experiences in his critical periods (Cole ibid. 11). The relational perspective focuses on regulation by relationships, for instance, mutual adjustment of the participants.

The question of sources of development needs to be clarified. Vygotsky defines development in relational perspective (see, for example, Vygotsky 1984). In general, mental development originating in relationships and higher mental functions are internalized after their appearance as relationships. Therefore, the teacher’s task is to follow this law and organize developmental learning inside ZPD. However, this process provokes questions about the mechanisms of change. It is necessary, therefore, to specify developmental change as relationships.

The definition of developmental event is presented in the notion of Zone of Proximal Development, which contains different measurements of development – “levels”. N. Veresov (2004) unfolds Vygotsky’s idea of development from the simple definition of ZPD to the general law of development. The Zone of Proximal Development is “…the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky 1978, 86).

The comparison of two abilities, individual independent problem solving and problem solving in cooperation with more capable others, indicates developmental potential in learning, which Vygotsky called the ZPD. However, it is difficult to understand the zone without the contextual and dynamic meanings of Vygotsky’s terminology (Veresov 2004, 15–28).

Development is manifested by higher mental functions appearing in relationships of process nature. Vygotsky’s idea of genetic experiment and his dynamic understanding of maturation of higher mental functions reflect his general dynamic vision, indicated by the word “historical” in the name of his theory. Therefore, he focused on developmental relationships in teaching and in psychological experiment (ibid.). To simplify the task of understanding developmental process, Vygotsky uses the metaphor of a fruit tree:

“…the zone of proximal development defines those functions that have not yet matured but are in the process of maturation, functions that will mature tomorrow but are currently in an embryonic state. These functions could be termed the “buds” or “flowers” of development rather than the “fruits” of development. The actual developmental level characterizes mental development
retrospectively, while the zone of proximal development characterizes mental
development prospectively” (Vygotsky 1978, 86).

Tension between actual and potential level of development of an individual
appears as a dramatic collision of relationships, on an “outer plane” of the child.
This happens, according to Vygotsky, before internalization to the “inner plane”.
The inner drama, as Veresov shows, inspires the child to develop.

The same structure of ZPD works in play, where “the child always behaves
beyond his average age, above his daily behavior; in play it is as though he were a
head taller than himself. As in the focus of magnifying glass, play contains all
developmental tendencies in a condensed form and is in itself a major source of
development” (Vygotsky 1966/1933, 101; cited by Veresov ibid.).

Veresov shows that sense making and meaning-making in play – a hidden
dimension of ZPD – are rather used as common social meanings of the
environmental staff to produce the child’s own sense. Attaching his/her own sense
to the concrete object of play, a child, according to the author’s reasoning, makes
dramatic collision by him/herself, a relation between the real and the ideal form:

“Dramatical collisions in interaction between the real and ideal forms,
emotionally experiencing as an actual collision, are the core of the process where
the social becomes individual” (Veresov 2004, 23). Thereby, the individual child
plays and develops in a complex world, involving the current environment and
the hidden dimensions of connections between common meanings and actual
individual sense: “…the field of meaning appears, but action within it occurs just
as in reality. Herein lies the main developmental contradiction of play” (Vygotsky
ibid.).

Connection between meaning and reality makes dramatic developmental
influence. However, the last description may relate to the child’s moments of
individual development also. Nevertheless, the question appears: how does ideal
form make influence as real and cause developmental change? How does the
dramatic collision bring the change?

The role of drama in human development (Vygotsky 1978; 1984) was
described in the psychological approach of Politzer (1980). Politzer places the
“dramatic thinking” on a theoretical footing of meaning making, experiencing and
development (ibid. 244–257).

It is obvious that no dramatic collision or contradiction brings about
developmental change only. Some of them cause neurosis interrupting healthy
development. Critical periods of development, undoubtedly, could be described in
Vygotsky’s language as inner drama. But for uninterrupted change resulting in
healthy development, collision is not enough. There is a conception of latent periods preceding the developmental crisis (Vygotsky 1984). Are they also involved in the hidden dimension? Or, maybe they come from previous relationship experiences? What are the specific contents of latent periods preceding the developmental change? These questions have something in common with an overall interest of developmental psychologists in the mutual influences between qualitative and quantitative changes in development (Cole ibid.).

### 1.1.2 Family relationships and personal change

The Palo Alto group (Mental Research Institute (MRI, CA, US)) developed a consistent scientific approach for the study of helping relationships. They eclectically integrated different approaches, such as L. von Bertalanffy’s General Systems Theory, neo-Freudian Ego-psychology, G. Bateson’s anthropology, V. Frankl’s existential position, M. Erickson’s theoretical views and practical experiences, N. Viener’s Cybernetics, K. Jung’s analyses, and even analyses of F. Dostoevsky’s novels. Most of the researchers had psychiatric and psychotherapeutic background (Bodin 1981, 266–273).

They studied interaction in the family as in a small social group with a history of relationships, expectations of future interactions and interdependence. The ongoing communication system of a family was considered a process, subordinated to the principles of the General Systems Theory. These principles operate more clearly and powerfully in a family than in group therapy. Therefore, interventions reorganizing a family system are indirect (ibid.). Greenberg (cited by Bodin ibid. 273) described relationships in systemic language and concluded that they are patterned and can be described using conventional units. Relationships are built and maintained using the following elements:

- family homeostasis;
- negative and positive feedbacks: counteracting or amplifying deviations in interaction among family members, leading to improvement or worsening of dysfunction;
- the rule hypothesis: people in continuing relationships interact in increasingly patterned ways and build descriptive rules, so that the family follows them;
- descriptive and prescriptive rules: rules about rules (meta-rules), stabilizing disruptions or deviations from patterns by sanctions;
changes, affecting through a new enlarged set of rules;
- quid pro quo: a conscious or unconscious family rule;
- punctuation, a rescue device for couples in conflict;
- circular causality: enlarging a behavioral S-R paradigm with linear causality;
- double-bind hypothesis (Bateson): formulated mainly for mutual influences among related “significant others” (ibid. 273).

The system model of MRI describes cooperation process units. However, a well-functioning family is defined using a conventional unit: “there is no one model of health or normality in families or marriages” (Jackson, cited by Bodin (1981), 274). The problem solving process in a cooperative family shows that in a well functioning family, a problem may persist but not paralyze the relationships (ibid.). In such a system, a false effort of managing difficulties brings problems. For instance, the concept of identified patient identifies one family member as a source of all problems. When this member has troubles rooted in the family relationships, his/her behavioral symptoms are misinterpreted. This makes the relationship process difficult to understand and distorts proper cooperation in the family system.

A family system performs self-regulation through circular causality and cybernetic feedbacks. The family cooperation helps to develop a balance between family closeness and its members’ autonomy. Von Bertalanffy defined the concept of a dynamic steady state. This state in a family system is opposite to equilibrium of closed or rigid systems, defined by some entry conditions. An open system in a steady state is independent from entry conditions, and defined by actual dynamic steady state itself (Watzlawick et al. 1967). Therefore, a family closeness is flexible. In addition, dynamic steady state of a family system develops through different paths, when different causes can lead to the same result (equifinality), and the same causes can lead to different results (equipotentiality) (ibid.).

The terms dysfunctional and functional families reflect poorly and well organized relationships. They reveal psychosomatic and psychopathological symptoms in the family system. Dysfunctional families have lost their abilities to:

- complete transactions;
- see others, reflect on them;
- see themselves;
- express hopes, fears, expectations to other family members;
- be assertive inside the family;
– ask direct questions;
– make choices, etc. (Bodin 1981, 276).

Bateson’s anthropological typology of human interaction patterns describes the morphological dimension of the idealized family system. The typology is based on an operational definition of concepts symmetry and complementarity, supplementing systemic approach with aesthetic thinking. The description of communicative positions, however, does not take the participants’ experiences into account. Relationships are transformed into idealized cognitive patterns, a cybernetic system; the schema of verbal interactions:

I Stable Symmetry: the successive talk of A and B defines the relationship as symmetrical.
II Stable Complementarity: the successive talk of A and B concurs in defining one of them as dominant and the other as submissive.
III Symmetrical Competition toward One-Up: the successive talk of A and B conflicts because both claim the one-up position.
IV Symmetrical Competition toward One-Down: the successive talk of A and B conflicts because both claim the one-down position.
V Asymmetrical Competition toward One-Up and Symmetry: the successive talk of A and B conflicts because one claims the one-up position and the other claims a symmetrical position.
VI Asymmetrical Competition toward One-Down and Symmetry: the successive talk of A and B conflicts because one claims the one-down position and the other claims a symmetrical position.
VII Fluid: the successive talk of A and B is none of the six configurations, but fluctuates (ibid. 277–278).

The tendency of the participants to polarize their communicative positions characterizes a pattern of complementary schizmogenezis. Symmetrical schizmogenezis is a tendency to remain with one another without any dependency on interaction features. Later Sluzki & Beavin (cited by Bodin 1981, 278) interprets complementary interaction in a clear cognitive way, as a reciprocal giving and taking of instructions, reciprocal asking and answering questions, reciprocal asserting of and agreeing to statements when partners are in unequal positions. The symmetrical interaction pattern, for instance, is defined as mutual exchange of referential statements, agreements, instructions in equality of
partners. They also use the variables of the previous constructs to construct a dyadic typology and the method of interactive speech analyses (ibid.).

The Palo Alto group uses metaphors of fluid or parallel to describe features of relationships (Lederer and Jackson, ibid.). Parallel relationships, for instance, include an important component of *dynamic attunement*, dyadic adaptation to changing circumstances. These authors also pay attention to *stability* and *instability*, distinct features of the marriage flow. In describing them, they combine the notions of *dynamic systems* with homeostatic tendencies: stable-satisfactory, unstable-satisfactory, unstable-unsatisfactory and stable-unsatisfactory (ibid.).

The members of the Palo Alto group (Watzlawick *et al.* 1967) tried to depart from the psychiatric position towards the *phenomenology of human open system interaction*. Bateson develops the Double Bind theory in the study of interaction patterns between polar positions of domination-submission. Originally, this theory was devoted to explaining negative mechanisms in family communication leading to children’s schizophrenia. Bodin (ibid.) highly appreciated this theory, saying, “It stands as perhaps the most definitive landmark in the revolutionary shift from an individual to a systems focus in concepts of psychopathogenesis”.

We agree with the author in his appreciation of the theory, which has made a positive shift in the study of psychopathology and healthy communication. The same shift from clinical to general phenomenological approach in the study of human relationships has taken place in existential-humanistic psychotherapy (Bugental 1987; Rogers 1961).

The analysis of personal dysfunction has evolved from the research of communication. MRI researchers describe logical destructions of communication using paradoxes. Watzlawick *et al.* (1967) have developed the “general pragmatics of communication”, expressing them as meta-communicational axioms:

- One cannot not communicate (ibid. 51).
- Every communication has a content and a relationship aspect such that the latter classifies the former and is therefore metacommunication (ibid. 54).
- The nature of the relationship is contingent upon the punctuation of communicational sequences between the communicants (ibid. 59).
- Human beings communicate both digitally and analogically. Digital language has a highly complex and powerful logical syntax but lacks adequate semantics in the field of relationship, while analogical language possesses the
semantics but has no adequate syntax for the unambiguous definition of the nature of relationships (ibid. 66–67).

- All communicational interchanges are either symmetrical or complementary, depending on whether they are based on equality or difference (ibid. 70).

Cybernetic and cognitive axioms subordinate relationships to the cognitive order. Despite cognitivism, axioms help to understand communication in the frame of phenomenological and systemic thinking.

The first axiom states the fundamental connectedness between communicator and environment. The second axiom points out the multi-levelness of the communication system. The third one manifests sequences of communicative changes, although linear. The forth one describes the holistic feature of any communication, and of verbal in particular. The fifth one shows some features of morphological order in communication.

Rules and structures of communication, developed by the MRI members, are significant as a holistic and scientific description of the general phenomenology of communication. Nevertheless, researchers have described the cognitive side of non-pathological relationships. Connections between analogous and discrete depiction of communication, communication sequences, axioms and general morphology give a convenient common base for the development of the phenomenology of relationships. This theory is a good example of a successful approach to a systemic-cybernetic phenomenological description of relationships.

### 1.1.3 Jerome Bruner’s ideas on intersubjectivity

One of the founders of cognitive psychology tried to overcome the cognitive restrictions in the analysis of relationships. Bruner focused on mutuality in choosing a partner in an undergraduate students group. He was astonished about the high communicative competence in very young children: “The competence seemed to be there, as if ab ovum; Very young children had something clearly in mind about what others had in mind, and organized their actions accordingly. I thought of it as the child achieving mastery of one of the precursors of language use: a sense of mutuality in action” (Bruner 1986, 59).

He writes that children by their first birthday have a sense of mutuality, and “are already adapt at following another’s line of regard that requires sophisticated conception of the partner’s mind” (ibid.). He looks at communication as expression with the interpersonal meaning in context. Bruner underlies the
intersubjective importance of language with a sense of mutuality in context. He concludes: “there must be something pre-adapted and pre-linguistic that aids us in achieving initial linguistic reference. …One has to conclude that the subtle and systematic basis upon which linguistic reference itself rests must reflect a natural organization of mind, one into which we grow through experience rather than one we achieve by learning” (ibid. 63).

Mutuality behind linguistic structures means that referential experience and experience of the other’s subjective world are pre-linguistic and prenatal (“ab ovum”). Mutual experience is a basic condition for further learning of language and structuring linguistic means “whereby we know Other Minds and their possible worlds” (ibid. 64). It is necessary for meaning making in intersubjective polysemy. It is basic for further negotiating and dramatic overcoming of ambiguities in meaning making. Finally, it is important for a responsible creation of linguistic realities, for the child’s own constitutiveness of language (ibid.).

Experience-based sense of mutuality, a prerequisite of cultural and linguistic communication, thereby, is a child’s first experience of mutuality genetically. The next basis for mutuality is M. Buber’s “I-Thou” encounter. Bruner supposes that these two bases have a priority in the development of the human’s “regulatory” self (ibid. 67).

Bruner tries to combine the cultural primacy and integrity of psychic functions in the child with a sense of mutuality ab ovum. He explains it by the concept of “perfink”, i.e. perceive, feel and think at once. He supposes that “perfink” develops the child through narratives and constructs, through the child’s coherence and cultural relevance, through the sense of self and the sense of others (ibid. 69). Finally, in search of a priority of one of them Bruner loses the difference between cultural development and hidden development ab ovum. However, it is not clear why he, who was first fond of basic mutuality, replaces it by its cultural mediator. But it is not necessary to make a choice between them; they are both important constituents of a total relationship.

1.2 The dialogic self

Basic mutuality arouses interest in dialogue as its manifestation. A. Fogel (1993) studies developing relationships, the dialogic self. From the beginning, he describes relationships resulting in the dialogic self from three interconnected perspectives:
1. **Relational perspective.** Cognitive functions of knowledge and memory are “the form of the relationship between the individual’s perception and action. …such embodied cognitions in infancy lead to a sense of self”. Fogel emphasizes the historical evolvement of the human mind and the sense of self between the self and the other. Evolvement begins in early childhood (Fogel 1993, 4).

2. **Developmental perspective.** Developmental change arises from everyday communication, in the flow of mundane encounters between the individual and the environment or social partners. The development is patterned but without an exact scheme of patterns. The concept of *co-regulation* is “the fundamental source of developmental change”, the core of developmental communication (ibid. 5–6).

3. **Cultural perspective.** Culture includes the development of communicative conventions, set of tools, media, and beliefs. Culture mediates and influences all relational experiences, thoughts and actions, and even in lonely people (ibid.).

These conceptual frames are in line with the Palo Alto group’s research, and cultural-historical psychology. Fogel (1993) uses a particular concept of co-regulation, which has something in common with Bruner’s mutuality. In contrast to Bruner, however, he organizes the research of the immediate manifestations of co-regulation. He carefully observes co-regulation in the mother-infant interactions. Relationships reveal the mother-infant *co-regulation patterns* structured by information in shared *intensity-by-time contour* (ibid.). These observations lead to the description of the dialogic communication and flow:

- Communication occurs when the infant’s signals (cry) serve as a source of information for the mother, and the mother’s behavior (voice variations, posture, gesture, picking up the child, etc.) is a source of information for the infant.
- The mother behaves in an *uncertain situation* which seems to the mother as if the child was actually trying to communicate with her.
- *Information* is created between people; it continuously changes as interaction unfolds, and it is difficult to establish who is the sender or receiver of information at any specific moment.
- *Co-regulation* is a continuous mutual adaptation, lasting adjustments to the partner’s actions; its process and outcome are spontaneous, not ritualized or totally controlled by the goals, and partially unpredictable.
Communication is not a totality of discrete states but a continuous process of the communication system on the so-called transactional level.

Emotions and expressions are socially constructed and dynamically created in the current communication; the infant is entirely within the realm of continuous unshaped communicative process.

The infant becomes aware of the self in relationship to another person (dialogue) through awareness of self-exertion and self-movement.

The force exerted by the mother and the infant can be depicted in a Force-Time diagram by continuous curves of diverse but co-regulated mother and child exertions (Fogel 1993).

Combination of information, co-regulation, uncertainty and force exertion between communicators in the communication system makes this concept more closely related to dynamic system notions. But communication is studied as it happens. Therefore, it is difficult to find the main prerequisites of the organization (of the order) of communication. Intensity-by-time contour is one possibility of control. For example, Fogel is leaning towards cultural activity: “an activity is cultural if it is done according to a shared intensity-by-time contour” (ibid. 23).

Cultural expectations and rules permeate this contour. However, this assertion is not obvious. First, it is not clear how the described contour is influenced by culture in general. It is also unclear how this contour takes human cultural expectations and rules into account, because it originally describes interaction in a pack of wolves.

Bruner and Fogel both combine cultural tools with cooperation and try to prove cultural priorities in cooperation. But it is too early to make any conclusions. On the one hand, it is not possible to explain dynamic patterns of human interaction by the cultural frame of the behavior of wolves. Patterns of interaction are spread widely and can be found in wolves as well as in the higher primates, or socio-ecological ant communities. On the other hand, human culture is not a privileged carrier of relationships in the Universe. It can never totally restrict or define each hidden motivation of prelinguistic communication or spontaneous interaction. For instance, it cannot restrict the creative spontaneity of play interaction, which must expand, by definition, beyond certain cultural boundaries. Thus, Fogel’s dynamic intensity-by-time-contour, perhaps, has another origin than just culture.

A. Fogel (1993, 34) defines co-regulation as a social process in general, when individuals dynamically alter their actions with respect to the ongoing and
anticipated actions of their partners. He fairly defines co-regulated patterns as something repeated and coherent over time. He often mentions individual constraints, which can be overcome by an emergent, creative action in co-regulation. He illustrates creative relationships in children’s play, when they overcome the rules and follow both regularities and variability. He shows that patterns of consensual agreement emerge from mutual negotiation and, thereby molding consensual frames which “must exist even before partners can actually engage in a focused communication about something” (ibid. 36). He notices some kind of an intrinsic order in the spontaneity of play. However, he tries to define it by previously verbalized constraints of a communicative process prior to communication. Nevertheless, it is unclear, how verbalized constraints could appear in the infant’s non-verbal activity and the mother’s combined verbal-nonverbal communication before their contact.

Communication structure can combine verbal rules with nonverbal agreements, and also with the unconscious intrinsic order of communication flow. We are living under the rules of mostly non-verbalized laws of the Universe (Watts 1969), and they work without primary influence of humans’ cultural description or pre-agreement. What really concerns the order of communication is a pre-agreement of the partners through mutual intention to communicate with each other; for example, to play together. In that case, preset verbal rules may destroy the play, its spontaneity and joy. Moreover, mutual intention to realize a common play will maintain cooperation both verbally and non-verbally owing to or despite previously established rules.

Fogel (1993, 36) defines the relationship frame as a verbally co-regulated consensual agreement about the scope of discourse and the focus or topic. The structure of the consensual frame is oriented to the adults’ verbal abilities, and has four main constituents:

- attention direction,
- spatial location,
- postural orientation,
- topic.

There are several potential versions in Fogel’s definition of the relationship frame, which could also comply with the infant’s abilities. For instance, if agreement will be a nonverbal intentional common agreement on the focus of relationships, then it can also organize the frame. Discourse should be in tune with the common focus, a topic, in particular. Fogel often mentions agreements between partners in
negotiations on play and objects of play, but forgets about the focus of the negotiations (ibid. 37). Neither does he make distinctions between the dynamic process arising of the frame and the common focus, on the one hand, and discursive focusing on the common topic, on the other hand. Fogel subdues the communicators’ attention to the fixed frame, but not to the focus. Therefore, the flexible frame loses its important dynamic characteristics, and tends to become a fixed essence, a thing.

Losing the common focus (even if it naturally changes in communication) as a major target of mutual communicative intention is equal to losing the aim and the sense of communication and thus the communication process flow. The back channel of communication and mutual feedback also becomes useless.

In spite of static frame of communication, Fogel makes undoubtedly important conclusions about co-regulation dynamics in the frame. They are as follows:

- In difficult communication situations, individuals often make movements which partially announce the participants’ intention; partial movements also help with the beginning of risky interactions.
- Framing is metacommunication, a communication about the way the communication is to occur; the consensual frame could also be co-regulated.
- Consensual frame is a negotiated and dynamic process with circular causality.
- The essence of communication is mutual creativity; interactive creativity inherits personal acts of creativity.
- Interaction synchrony occurs as one partner’s anticipation of another’s attention or behavior by co-directing his/her own activity, but not exchanging behaviors (ibid. 36–41).

Concepts of intention, co-regulation and metacommunication, developed by Fogel, are rather behavioral than cultural, cognitive or experiential. We can see it in the definition of interaction synchrony by Frank Bernieri, used by Fogel, due to its similarity with co-regulation. It is an “apparent unification of two behavioral elements into a meaningfully described whole, synchronous event. The elements of this event may be simultaneous, identical, and in phase or alternating, mirrored, and out of phase. …they create a ‘whole’, or perceptual unit. …Synchrony …is …extent of gestaltlike harmoniousness or meshing of interpersonal behaviors” (cited by Fogel 1993, 56).

Fogel notices some holistic features of a couple’s behavior and self-maintenance of the couple’s commitments. He connected the concept of matching
to holism as a complementary of interaction synchrony. Matching is “when one individual makes his or her actions more similar to those of another individual” (ibid. 58).

*Attunement* and *co-regulation* are mainstream notions. They are described by D. Stern (2003). Phenomena close to attunement and co-regulation often occur between therapist and client (Rogers 1961; Bugental 1987). In helping relationships they are organized on purpose.

Fogel intends to integrate these concepts in one common idea. He uses J. Gibsons’ categories, such as variants and invariants, optic array, perceptual flow field. He tries to connect perceptions and actions which “inform each other” in mutual coordination (ibid. 66). However, he arranges a “basic model of perception-action system” (ibid. Chapter 5), which does not express any co-regulation dynamics or patterns.

![Diagram of the basic model of the perception-action system](image)

**Fig. 1. Basic model of the perception-action system (see also a Figure 5.4 in A. Fogel 1993).**

Fogel endows mutually created information with the status of major *force*. Information is defined as “what happens to me when I perceive your smile” (ibid. 56). It surely reflects its origin – the dynamic integer of interaction and its participants. Information, according to Fogel, is created in Gibson’s sense as a difference occurring in the perceptual field of flow “in the form of perceived relationship between the variants and the invariants.” He concludes that information makes strong influence on co-regulation and on relationship flow.

Fogel’s understanding of mutually created information has a definite parallel with the mutual awareness of Gestalt-therapy, as we will see later on in this study.
Fogel (1993, 68–71) draws two conclusions that he repeats in his later research:

- The co-regulated creation of consensual frames is the process by which relationships develop.
- Relationships sustain themselves when information is mutually created.

He fairly assumes that relationship patterns show features of complex systems. They emerge in relationships by converging the elements of the system “toward a relatively stable and identifiable pattern of functioning” (ibid. 103). Fogel sees the pattern organization as a mutual restraining of participants, when they limit the degrees of freedom in their mutual behavior. Reducing the degrees of freedom happens in actual encounter and, according to Fogel, creates information. Through the example of the communicational behavior of wolves, mentioned above, he carefully follows frames of behavior execution changing in animals. One animal’s move constrains another partner to match it. The matching has actual meaning for the former cognition or dangerous experiences; a wolf cannot run away while risking to be attacked. Thus, as supposed, danger regulates further coordinated movements: “We can formalize the description of the frame… as the set of degrees of freedom that have been consensually constrained, via the initial co-regulated negotiation, while the remaining degrees of freedom in the system are currently part of the negotiation process.

Information is created when degrees of freedom are compressed, when one ‘submits’ to the restraints of the collective” (ibid. 104).

Fogel’s collective co-regulation, thereby, is a continued compression of degrees of freedom, continuous ceding of regulatory control from the self to the other with the negative experience of being attacked, or of fear in context. However it is not obvious, what he calls “information”: the actual fear, the previous dangerous experiences, or the current signals. In the classic W. R. Ashby version, information is a measure of the structural variety of a cybernetic system (Ashby 1956, 140). Interaction squeezing partners by risk control, results in reducing the variety. Therefore, it is difficult to agree with the statement, “repeating patterns in a relationship are symptoms of information creation” (Fogel ibid.). Repetition is rather a symptom of decreasing of information, indicating growth of entropy (a measure of disorder).

Moreover, reducing degrees of freedom in animal interaction definitely cannot be a basic process in human relationships. A human being acts in strong accordance with subjective meaning and sense ruling by all frames – stereotypic
or new. It is exactly freedom in choosing every step of human life which, besides, helps Fogel to see two different coexisting kinds of stable consensual frames (Fogel 1993, 114):

- Frame for creativity and innovation, when “stability is a dynamic and mutually engaging process”.
- Frame for rigidity and dissolution, assigned “to avoid inventiveness and creativity”.

The author tries to describe these patterns by means of basic principles of General Systems Theory: “most forms of social communication are continuous process communication systems” (Fogel, 1993). He refers to the following principles:

- Systems are complex; changes in any single part of a whole system will create corresponding changes in other related parts of the system.
- Systems are organized; the author means that the behavior of a system can be described in its own terms by the collective behavior of subsystems.
- Systems are self-stabilizing and self-organizing; the stability of the collective organization of a system is maintained by dynamic fluctuations of activity between its component individuals.
- Systems exhibit equifinality; different dynamic processes lead to similar system organizations, usually – to a small number of collective forms in spite of the complexity of the dynamics.
- Systems form hierarchical patterns, and all the orders – higher or lower – are the part of the same system and are the natural result of the system dynamics (ibid. 45–48).

There are some inconsistencies in Fogel’s interpretation of the systemic principles. For instance, the third principle needs a revision: fluctuation cannot maintain stability, but causes instability and system change (Prigogine 1980; Prigogine & Stengers 1988; Knyazeva & Kurdyumov 1992; 2007). Anyhow, later on the author is inclined to use the specific notions of pattern and attractor. Communicative patterns are seen eclectically as systemic, symmetrical, asymmetrical, unilateral, disruptive, unengaged (Hsu & Fogel 2001, 94). These analogies can help to make a good model, when they build up a picture of a dynamical system.

Fogel says that communicative development should not be defined through the individual but through the fundamental “you and I” (Fogel 1993, 61). But it is not necessary to refuse an individual sub-system replacing it with a system of a
dialogic organism. According to the first, fourth and fifth systemic principles (Fogel), a system reconstructs some features of sub-systems, but does not eliminate them. When the author discusses the priority of relationships, he skips the same priority of the personal intention and its strong influence on relationships.

When Fogel (2006) and Fogel et al. (2006) describe interaction patterns, they compare attractors, i.e. notions of the dynamic system approach to repeating behavioral patterns (ibid. 15). But their similarity is not always obvious: in many cases the control parameters change and the attractors are alternating and moving through dynamic sequences. Attractors are not a separate phenomenon like a thing, but dynamic functions and processes in the phase space (Kurdyumov & Knyazeva 1992). Later on Fogel et al. (ibid.) also admit this fact, and mention the important feature of human interaction dynamics: “communicative actions change people’s behavior …because those actions have a certain “meaning” that is shared by the participants” (Fogel et al. 2006, 16).

Moving to developmental change in relationships, Fogel opens a role of novelty in the form of new information: “Novelty, generated sui generis within the system is thought to be the seed of developmental change” (Fogel 1993, 32). Novelty, however, comprehended as embodied cognition, transfers information into knowledge. It is executed by means of participatory cognition and memory, or by the embodiment of activity and the engagement of perception-action system with the environment.

Different kinds of memory are manifested in the active experiencing in the present. They are connected to repeating patterns called generalized event structure or internal working model, such as everyday path to school. A creative use of them in every new relationship is realized by adjusting them to the present situation (ibid. 122–128). In contradiction to his strong orientation to past memories and imaginative activity, Fogel affirms that there is no stored or generalized memory on the ways of experiencing relationships. Therefore, imaginative cognition, for instance, comes after imaginative dialogs (ibid. 131).

After the complex cognitive construction, A. Fogel postulates a dialogical self. It reflects on how a child uses the imagination of his/her own participatory memory, which is a re-enactment of procedures used with objects in the past and acquired in the mother’s company, a real play partner (ibid. 133–134). The infant participates in two frames:
− Consensual frame as a result of co-regulated negotiation with the mother.
− Non-social communication frame in connection with the physical environment (ibid.).

This results in participatory cognitive dialog with the mother and the creation of information in Gibson’s sense, by comparing the perception and action between distinct frames. Thereby, subjective meaning (Fogel et al. 2006, 16) as information has no influence on frames, and it loses connection with the frame. A frame that appeared in a dialog in the past, plays a role of procedural memory for re-enacting in the child-environment relationship in the present. Relational dialog between the past and the present of a certain individual is a basis for frame creation.

Cognitive dialogical mechanism by A. Fogel (1993) can be resumed as follows. Through participatory dialogical cognition, an infant creates information such as

− recognizing what is present in the current relation from his past frame,
− recognizing what is not-present,
− putting the last frame as the first,
− coalescing a co-participating frame to develop imaginative cognition.

If cognition is the experiencing of being related to something or someone, and an infant is somehow capable of detecting invariants in complex situations, the child should be capable of relational cognitive activity from the pre-linguistic age. This creates the basis for the cognitive “discovering a sense of self in relationships” (ibid. 134–135) and for seeing the self as a cognitive “set of one’s personal stories, or narratives, told in inner speech or told to others. …The self is both parts of a dialogue; it is a continuously re-created co-regulated process. …When the dialog on a topic turns into a monologue … when the story is unchanging, that part of the self becomes a rigid frame” (ibid. 139–140).

Affection towards a topic as to system constitution and pattern formation factor creates a contradiction between suggested cognitive origins of the dialogic self of the infant, on the one hand, and the unavailability of cognitive tools for the infant in the prelinguistic phase of development, on the other hand. Describing the dialogical self, Fogel often emphasizes his notion on absence of an exact center of the self in the adult, which helps the researcher to dissociate his dialogical self from the Cartesian or individualistic notion. Mentioning Hubert Herman’s philosophic notion of the joint I and me, where me is a kind of executor of the I’s
imagination (Fogel 1993, 140), he presents his own embodied dialogical cognition process as the self itself. The question “who is that one who goes through the dialogical developmental process?” gets answered: the embodied cognitive dialogical process itself, the memory, with an unclear motivation and development direction. So, this results in adult seen as an endless spontaneous embodied cognitive dialog with unexpected qualitative changes: there is no one who develops even if he is not an individualist. So who reflects, who cognizes or knows is unclear.

The author argues with D. Stern saying that for the child to be centralized is to be free from context or from dialogical cognition. We cannot agree with this statement: a dialog can be naturally integrated with the growing complexity inside of the self, and this notion is far from an individualistic fixation.

In Fogel’s social definition of the self: “individual’s imaginative or participatory cognition of co-regulated relationships” (ibid. 146; emphases added), the necessity of the individual is obvious. The individual participates in relationships and co-regulates himself when interacting with others, he experiences and cognizes, he becomes acquainted, without losing the dialogical nature of the perception-action process of the embodied cognition of the self.

This individual is not someone from a naïve positivistic interpretation of the Cartesian position of pure and all-knowing one who is isolated from his body, from the world and the others. There is nothing isolated in the open complex systems (Capra 1996; 2002). The growing complexity of an individual is the sufficient side of the self-development through interactions. Moreover, the self is not only a constant ubiquity of a dialogic process, a constant cognitive activity without any silent break or self-change out of a dialogue. There are also non-dialogic and over-cognitive experiences in the individual development. But this is not contradictory to the meanings created in the dialogue, and is in agreement with Fogel’s thesis that “the developmental sustenance of the dialogical self is self-creation” (Fogel ibid. 153).

In his later research, Fogel (2006) pays much attention to meaning making in communication. He defines meaning a bit differently than he did earlier (1993) as “perception of “difference” between two or more communicative actions” (ibid. 7–8). Meaning making, thus, is an active process, manifested “in the changing actions or interpretations of participants in a communication process” (ibid. 8). Turning the meaning making to the researchers position, he asserts that “the study of dynamic systems involves one additional constituent to any collective that is being observed: the observers point of view” (ibid.). This strongly influences the
researcher’s viewpoint, because “the patterns and processes that are described, counted, and analyzed emerge from the relationship between the observer and the system” (ibid.).

We totally agree with this methodological position, making the observer a part of the studied dynamic system. But we cannot agree with the old interpretation of the attractor as a pattern “in the brain-behavior-sensory system” (ibid.), because attractors organize interactions between individuals or between the individual and the environment. Thereby, in relationships the attractor cannot be localized only inside an individual system. It is rather a steady state in the relationship processes.

Fogel (2006) is also interested in two dynamic phenomena: the macroscopic order in the dynamic system and the microlevel behavioral patterns. He is interested in the emergence of system of the macroscopic order in two dimensions of developing relationships: between the constituents of the system and between the observer and the system (ibid. 10). Fogel suggests a continuous process model of communication with a sequence of changes (ibid. 13; Fogel & Garvey 2007). They begin on the microlevel, and result in a change on the macrolevel. The levels of change correlate with the novelty in the behavioral patterns. The first microlevel change (Level 1) shows dyadic shifts from one mutual action to another with “ordinary variability within a stable attractor” (Fogel 2006, 12). The second change, Level 2 shows “innovations, perceived as different from ordinary variability of Level 1 change”. This change is mostly discursive and becomes meaningful for the system constituents (ibid. 14–15). Level 3 is developmental change. Fogel sees it as a choice of one attractor among many: “changes at developmental level grow out of changes at the micro- and macrolevels that occur through variations and innovations” (ibid.). Fogel describes a probable developmental change as the increase of the energy level by spontaneous occurrence of “innovative variations” of information (ibid. 15–16). Spontaneous emergence of innovations makes him to put questions: “How does change occur? …Does the emergence of a new pattern tend to suppress the old patterns or to coexist with them?” (ibid. 16–17). In search for the answers, he offers microgenetic research design (Fig. 2) with variability of units of analyses – intraindividual, interindividual, ecological and sociocultural (ibid. 17–21).
Fig. 2. Observations design by Fogel (2006; Figure 1).

However, Fogel still holds patterns as attractors (1993; 2006), and experiences difficulties with this notion. In spite of these difficulties, his microgenetic research design shows results which bring his approach (Fogel 1993; 2006; Fogel & Garvey 2007) closer to the notions of relationships developed in Gestalt Therapy.

1.3 Organized relationships leading to personal change

Compared to Fogel’s theory, the Gestalt approach to the helping relationships has different origins, structured in different style, different dimensions and constituents. It also uses a different approach to relationships: Fogel’s research group proposes studying relationships as they are, whereas the Gestalt approach deals with intentionally organized relationships.

The Gestalt approach initially focused on a holistic human-environment relationship, and later widened to human-human-in-environment relationship. Frederick Perls, founder of the Gestalt approach, emphasizes that the Gestalt quality is a holistic quality of life itself. He suggests seeing Gestalts, organized units in therapy and in life itself. However, in contrast to Fogel, awareness builds and restructures the whole of the dynamical system.

According to the Gestalt view, interaction happens with the purpose of fulfilling the needs or intentions. A brief description of the Gestalt-therapy, a way towards fullness of life usually includes the following principles:
- **Awareness**, or being aware of oneself and contact with the current situation inside or/and outside of the self.
- **Responsibility**, or response-ability of the individual, ability for active and aware reply to the current psychological and environmental phenomena, influence.
- **Actuality**, being here-and-now, or mode of identifying with current event; “now-and-how” activity position, which means appropriate responses to the actual situation.

In his last book, Perls outlined the coherent aspects of Gestalt. As up-to-date foundations he described:

- Gestalt Psychology.
- Homeostasis.
- The Holistic Doctrine.
- Contact boundary (Perls 1973).

The constituents of the theory are expanding as cognitive and metaphorical explanation of their content. They are as follows:

**Gestalt Psychology**

Perls asserted the need of understandability of psychological theory as a whole. Impressed by the holism of Gestalt psychology, he applied it to human-environment connections. Thereby, the Gestalt approach “is not necessarily the individual bits and pieces that go to make up the theory, rather it is the way they are used and organized which gives this approach its uniqueness” (ibid. 2). This is the way Perls used any theoretical findings to develop his theory: “man does not perceive things as unrelated isolates, but organizes them in the perceptual process into meaningful wholes” (ibid. 3).

There is a here-and-now based reference frame, originating in the client’s perception inside his/her presence. Therefore, the therapist’s reference frame performs complicated movements between the client’s position and his own.

Subjective meaning of upcoming Gestalt is manifested through interest; “as long as there is interest, the whole scene will appear to be organized in a meaningful way” (ibid.). When the interest comes down, the meaningful organization of the actual situation, the Gestalt, fades away. Gestalt is a German
word without an exact English equivalent. It means *a pattern, a configuration, a particular form of organization* of event or of organism into a whole:

“The basic premise of Gestalt psychology is that human nature is organized into patterns or wholes… it can only be understood as a function of the patterns or wholes of which it is made” (ibid. 3–4).

Gestalt-therapist J. Zinker describes a wider and self-centered holistic organism-environment connectedness: “no matter if we deal with the “cooperative” or “resistant” sides of the organism, we have a tendency to move toward its *motivational center*. All parts and forces of the organism are *integrally connected*, both structurally and functionally, so that each minute part leads toward a fuller sense of the whole” (Zinker 1994, 119; emphasis added).

**Homeostasis**

In Gestalt, homeostasis manifests the constant adaptation process, “by which the organism satisfies its needs. …All life is characterized by this continuing play of balance and imbalance in the organism” (Perls 1973, 4–5). It is rather a metaphor, describing a “process of *self-regulation*, the process by which the organism interacts with its environment” (ibid.).

Perls is concerned with the need for psychological contact among other psychological needs appearing in the disturbance of the psychosomatic equilibrium (ibid. 6). The search for the psychological equilibrium is complementary to a biological homeostasis: “each contains the elements of the other” (ibid.) and each is a constituent of holistic self-regulation. “The more intensely they are felt to be essential to continued life, the more closely we identify ourselves with them, the more intensely we will direct our activities towards satisfying them” (ibid.).

The complex need to keep a dynamic equilibrium, connected to identification, is formulated in terms of homeostasis. However, it manifests rather the dynamic steady state of an open system, described by von Bertalanffy (1979). The dominant need appearance is called *foreground figure* in the Gestalt. The other needs are temporarily receding into the *background*. The individual *identified* with the need or goal manifests the actual motivation power. Urge towards *figure* creates a steady state in a psychosomatic organism, getting a result by some chosen track. “This is called *equifinality* as found in many organismic processes”, – says Bertalanffy (1979). Thereby, when in the Gestalt we say homeostasis, it could also mean reaching of equifinal result in search of a steady state.
The Holistic Doctrine

The doctrine of human as a unified organism built by Perls from early the 1950s until the end of his life was under “complete ignorance” (Perls 1973, 11). In spite of many concepts of psychosomatic unity, the symbolic (cognitive) way of thinking in psychology is still enthroned as a divided and most important reality. Perls paid attention to the phenomenology of symbolic activity unfolding: “symbols begin as labels for objects and processes; they proliferate and grow into labels for labels and labels for labels for labels. The symbols may not even be approximated in reality, but they start in reality” (ibid.).

Human organism is a holistic open system in field. On one hand, “thoughts and actions are made of the same stuff” of different levels. Moreover, “we can translate and transpose from one level to another” because of the holistic unified field. Inside of this field mental and physical actions merge together, “are of the same order”, are equally observable as manifestations of being (ibid. 14–15). On the other hand, “no individual is self-sufficient; the individual can only exist in an environmental field. The individual is inevitably, at every moment, a part of some field. His behavior is a function of the total field, which includes both him and his environment. The nature of the relationship between him and his environment determines the human being’s behavior” (ibid. 15–16).

The mind and the mental activity, thereby, are constituents of the holistic activity of man. Mental activity performed at a lower energy level than the physical one, is similar to action with saving time, energy, work and physical substance. Diminishing intensity of interaction with the environment turns physical behavior into mental activity. Increasing intensity turns mental behavior into the physical one (ibid. 12–13).

Perls describes the dynamics of rolling out, folding of action and energy connected to mental processes. Thinking involves polymodal activities, improving our capacity to manipulate symbols like dreaming, imagining, theorizing, anticipating. In the concept of fantasy, Perls generalizes constructive and destructive mental activities: “Fantasy activity, in the broad sense in which I am using the term, is that activity of the human being which through the use of symbols tends to reproduce reality on a diminished scale. As activity involving the use of symbols, it derives from reality, since symbols themselves are initially derived from reality” (ibid. 11).

In the Gestalt approach, thinking in place of action is a mode of avoiding the actuality. Therefore, activity diminished by thinking is fantasy. It gives a human
being a “tremendous advantage” of extra energy to build cultural tools, inheriting the fantasies of all preceding generations, accumulating knowledge and understanding, enriching the life of the whole species. Perls confirms the intermediate stage for thoughts and deeds, “the stage of playing at” (ibid.), which is unfortunately poorly theoretically explored.

Perls uses mental activity in the Gestalt therapy as a key (ibid.) to the clients’ physical activity, and vice versa. But how the nature of thinking participates in creating the Gestalt is still undisclosed. Rejecting the fixation on symbolical tools, he disregards the backlog of mental experience joined to awareness. He does not pay enough attention to meanings, intertwined with goals and intentions. Using symbols for approximation towards meaningful, maybe existential reality makes them a necessary part of aware comprehension. Only when symbols definitely isolate us from reality, we displace it by inappropriate fantasizing.

**Contact Boundary**

Perls avoided the division of body and psyche, as of division into organism opposite to the environment. They are dialectical opposites: “The environment and the organism stand in a relationship of mutuality to one another. Neither is the victim of the other” (ibid. 17; emphases added). Similarly, experience is not divided into internal and external either. The sensory system supplies the organism with orientation, the motor system – with means of manipulation, but without any priority between them. Mutuality between them, as well as between the organism and the environment in general, makes manipulation by environmental objects, i.e. actions, possible.

Healthy functioning of the organism in the environment is an ongoing process of total involvement and engagement in what one is doing at every moment. Being involved in the situation long enough to close Gestalt allows moving on to another activity. Involvement into the environment makes a field: organization plus environment equals field (ibid. 17–18).

In order to achieve needs satisfaction, the organism uses connected systems of contact, of orientation and manipulation. Looking at the contact process dynamics, he tries to widen his holistic vision:

“Contact and withdrawal are dialectical opposites. They are descriptions of the ways we meet psychological events, they are our means of dealing at the contact boundary with objects in the field. In the organism/environment field the positive and negative (contact and withdrawal) cathexis behave very similarly to
the attracting and repelling forces of magnetism. As a matter of fact, the whole organism/environment field is one unit which is dialectically differentiated. It is differentiated biologically into the organism and the environment, psychologically into the self and the other, morally into selfishness and altruism, scientifically into subjective and objective, etc” (ibid. 21).

For a healthy contact with the environment and withdrawal from it, it is important to have capacity to discriminate what is positive for the organism and what is negative. Confused capacity destroys appropriate behavior of the individual and is neurotic. If it works well, acceptance and rejection, the contact and withdrawal components are present and active. Then contacting the environment is “forming a gestalt” (ibid. 22).

Thus, the system of organism/environment contact satisfies the needs of the organism by means of a sensory/motor system, using the polar rate cathexis (or valence) of the organism/environment field, feeling impatience and dread. It sets in motion energizing actions by the force of emotion, the very language of the organism (ibid. 23). Emotions modify excitement according to the situation that has to be met: “excitement is transformed into specific emotions, and the emotions are transformed into sensoric and motor actions. The emotions energize the cathexis and mobilize the ways and means of satisfying needs” (ibid.).

The main spatial-time and psychosomatic dimension of the Gestalt approach is defined as the “here and now” or, more often, as the “now and how” event. This most probably came to the Gestalt approach from Perls’ Zen meditation experiences. It is necessary to disclose this dimension of contact boundary.

A healthy individual lives in a dynamically balanced actual flow of relationship. He is one “who can live in concernful contact with his society, neither being swallowed up by it nor withdrawing from it completely, is the well-integrated man. He is self-supportive because he understands the relationship between himself and his society, as the parts of the body instinctively seem to understand the relationship to the body-as-a-whole. He is the man who recognizes the contact boundary between himself and his society… Man seems to be born with a sense of social and psychological balance as acute as his sense of physical balance. Every movement he makes on the social or psychological level is a movement in the direction of finding that balance, or establishing equilibrium between his personal needs and the demands of his society. His difficulties spring not from the desire to reject such equilibrium, but from misguided movements aimed towards finding and maintaining it” (Perls 1973, 26–27; emphasis added).
The contact boundary divides and connects the organism and the environment, involving the social one. It is usually described using a metaphor of a cell’s membrane. Complexity of the organism/environment connection, however, is higher than the possibilities of the membrane metaphor: it is a dynamic process of an ongoing relationship. The wave-like flow of connectedness can only be seen if the observer follows each moment of the flow shape change with his/her sense of balance.

Since Gestalt is a therapy of contact (Perls 1973; Ginger & Ginger 1999), it focuses on events on the contact boundary. In the therapy session, a dynamic connectedness flow through contact boundary defines the special spatial-time and psychosomatic dimension of each relationship event. This dimension is restricted by a current event in a current moment – “here and now”. It differs from the ordinary time flow, usually associated by the Greek word “chronos”. The frequently used “now and how” stands for the subjective experiencing flow intertwined with action, and refers to participants’ sense of responsibility for it. After D. Stern we can accept that “the Greek’s subjective conception of time, kairos, may be of use here. Kairos is the passing moment in which something happens as the time unfolds. It is the coming into being of a new state of things, and it happens in a moment of awareness… Events come together in this moment and the meeting enters awareness such that action must be taken” (Stern 2004, 7).

The process of the Gestalt-psychotherapy in Perls’s approach organizes completion of uncompleted gestalts, events of the individual. Completed dynamic patterns lead the self towards increased self-support and self-awareness. Moreover, the therapy teaches to cope with coming events more spontaneously and creatively. This invests the individual with self-sufficiency and ability to self-support.

What is it that makes Perls see healthy human functioning as functioning alone? Is there a fundamental nature of individuality calling him to claim this? This question may be answered by looking at the Gestalt-models of the organization of fluent relationships between human and the environment, and between human beings in the environment.
1.4 Flow of relationship dynamics through contact boundary: contact cycle

Not all of the Gestalt Therapy schools agree on the concept of contact cycle and theory of self as a necessity. Nevertheless, they are needed to understand the organism-environment and human-human interactions as dynamic patterns.


Perls described the origin of the contact cycle in his first book “Ego, Hunger and Aggression” (1969a). He performed a theoretical investigation, criticizing Freud’s theory of psychotherapy. Relationships between organism and the environment, both intrinsic and extrinsic, were initially described as the cycle of the inter-dependency of organism and environment. It was constructed of six stages:

1. The organism at rest.
2. Disturbing factor, which may be:
   a) internal or
   b) external.
3. The creation of an image of reality or creating of a real object (plus/minus functions and figure/phone phenomena).
4. The answer to the situation aiming at
5. a decrease of tension – achievement of gratification or compliance with the demands, resulting in
6. the return of the organismic balance (Perls 1969a, 44–45, 69).

Perls points to external and internal disturbances as initiators of relationships cycle, and asserts that “the external cycle is not different from the internal” (ibid.). This generalization of inter- and intra-organismic processes he called instinctive organismic self-regulation, based on homeostasis. Therefore, historically the first contact cycle in the Gestalt approach is also known as an instinct cycle (Perls, 1969a) and the Forecontact – Contacting – Final contact – Postcontact sequence (Perls et al. 1980).
The same psychoanalytical instinctive inclination of Perls, a former psychoanalyst, can be seen in discussing relationships between organism and “mind” as subordinated to biological needs (Perls 1969a, 42):

1. Both mind and reality are complements of an organism need.
2. They function according to the figure-background principle.
3. Once gratification has been obtained, both the image and the real object disappear from our consciousness (ibid.).

When organism is at rest, cycle cannot be interrupted. Therefore, Perls chose the point of rest as the point of origin for the cycle dynamics (ibid. 69–70). However, there are some doubts concerning the simplicity of the last statement. Actually, any human organism at rest makes billions of oscillations in different scales. We suppose that Perls had in view some deeper state of consciousness.

Further historical development of the contact cycle extends beyond the scope of pure instincts, and is known as *Awareness – Excitement – Contact Cycle* (Zinker, 1977), the *Healthy Cycle of Gestalt Formation and Destruction* (Clarkson, 1989), the *Gestalt experience cycle* (Zinker, 1994), and the *Cycle of Needs Satisfaction* (Ginger & Ginger 1999; Lebedeva & Ivanova 2004). To deal with relationships of couples and groups and to develop the purposeful coordination of their relationships, Joseph Zinker offered a cycle of contact-withdrawal between two or more participants – the *Interactive Cycle* (Zinker, 1994). In order to find theoretically satisfactory dynamical pattern, we will take a brief look at some of the offered “cycles”.

The pattern of fluent interaction most often used in Gestalt is Goodman’s contact cycle (Perls *et al.* 1951; 1980). In the organism-environment system, the self (S) passes through four consecutive phases alternating one another in time (T) (Fig. 3). Usually, it is explained through metaphorical analogy; a patch of sinusoidal wave, more precisely, one half of it. At the end of the curve, there is some experiential addition; the result of the creative adjustment of the self (dS). It is experienced as growth of the subjective order of the self. Unfortunately, biological “satisfaction” or “gratification” concepts are often in use. They narrow the totality of subjective experience and may mislead.

In general, the contact cycle is manifested through alternation of relationship phases, spilling over one to another. We will illustrate each phase using an example of child play. Many examples of the contact cycle flow are found in books on the Gestalt-therapy (for example, Ginger & Ginger 1999; Lebedeva & Ivanova 2004; etc).
**Fore-contact.** This phase characterizes the appearance of some *disturbance*, registered by the organism sensory system. The growing awareness of the psychosomatic organism organized or not by a professional helper, is revealed as awareness of feelings and awareness of the current personality of the self; of those who feel the disturbance. When the disturbance is clarified, it arises as a figure on the background of the rest of the organism-environment system.

Even if the origin of the disturbance could be different, internal or external, the awareness of the figure relates to the inter-organism environment. In other words, any disturbance which becomes a figure has its inter-organism correlate. It arises as attracting attention in the inter-organism field, stretching between the self and the meaningful environment. The individual, relating disturbance to him/her, becomes aware of it and manifests it by words, image, metaphor or other description with a subjective meaning. Verbal expression is followed by nonverbal correlates and by the growing of the organism energy.

**Example.** A 3-year-old girl playing in a sandbox in the kindergarten playground gets an uncertain feeling, manifesting a necessity of something. She begins to turn her gaze around, searching for something or somebody meaningful for her. She sees two boys clashing, a girl playing with a puppet, a tutor, and – suddenly – feels excitement seeing a shovel. Her face brightens up, she smiles, jumps from the sandbox and runs towards a shovel not far off. Thereby, playing with the shovel in sand is her *figure*.

![Fig. 3. Contact cycle of P. Goodman (Perls, Hefferline & Goodman 1951; 1980).](image-url)
Contacting. The awareness of a figure makes it necessary to find a preferable action to attain the need. The activity mode leading towards the completion of the Gestalt – meaningful need or aim – is under examination. There is a wide variety of activities entailing attainment of the need or goal. Equifinality (von Bertalanffy 1979) of the system approach is at work. The energy of excitement by the novelty of the figure transforms into activity energy, also manifesting through emotions. Activity mode trials alternate one another until one of them is chosen as fit.

Example. The girl, finding a shovel, realizes that she wants to play with sand making forms of it. She turns around her gaze and body, rushing towards a sandbox. She runs towards it, passing boys and the tutor without paying attention to them, but suddenly stops near several sand-cups. She stands for a while looking at some of them, then selects two and goes back to the sandbox. The chosen activity is to play with sand and the shovel and to make some sand cakes.

Final contact. It is full involvement in performing a meaningful relationship, which allows need satisfaction. Actions, if not interrupted, flow fluently. Emotions are transforming fully and creatively into activity energy, and attention is concentrated. Actions show the competency and involvement of the self in what s/he is doing. Full intertwining with the environment demands the most intensive work at the contact boundary. This specific functioning regime is also known as middle modality. The self is in a healthy and responsible confluence with need or goal.

Example. The girl is in the sandbox. She is digging sand with shovel, making several holes and filling the sand-cups with sand. Her eyes are engaged totally with her actions, respiration rhythmic, attuned to her hand and body movements. She does not hear the tutor, calling the children to go in the arbor. She is deeply involved in the relationship with the sand in making sand cakes; she is in purposeful confluence with the shovel and sand.

Post-contact. There is a fading energy of activity and relaxation because of attaining the need, aim or realizing the sense of action. The rhythm of activity reduces, the individual turns the gaze and the body from the activity zone, sometimes tends to stay alone or in silence. S/he needs to turn her/his attention from the former activity to spend energy on the appropriation of the received. Everything what was needed before is now felt as done. The experience of a new intrinsic order can be clearly discerned.

Example. The girl has finished baking 5 sand cakes, put a stick between them, and smiles. She turns away from the sandbox; lets the shovel fall, and is looking around. She notices a group of children inside the arbor and runs there.
Contentment from the sand cakes is an important sign of the need or the goal completion.

Fluent organism-environment interrelations result in a new subjective order, depicted as dS (Fig. 3). However, the features of new subjective order have not been studied well.

Perls (1969c) postulates that the basic function of the organism is to discover. This function is seldom mentioned in the theory of the Gestalt approach. Researchers are attracted by the next step after discovery, namely novelty and creative adjustment to new situation. Nevertheless, the Gestalt therapy is known as creative therapy organizing a new intrinsic order in the client.

The creative therapist (Zinker, 1977) organizes the client’s discoveries by constantly widening his/her awareness. The most profound description of the creative aspects of this therapy and its major flow has been given as the cycle of experience by Joseph Zinker in his “Creative Process in Gestalt Therapy” (1977). In the chapter “The Creative Leap” he emphasizes two basic constituents of the creative process in therapy:

- The therapist’s relationship with the client’s unique personal integrity, keeping the client’s structural and functional integrity for years of his life.
- Revolutionary molding – the client’s experiments with novel inside the whole of the client’s field, performing both inside and outside of himself (Zinker 1977, 21–22).

View of the self through creative deepness and activity widens our awareness of man beyond the purely biological notions. The unity of creative experimenting and self-integrity results in self-change named by Zinker as a cycle of experience, or “awareness – excitement – contact” cycle. It is depicted by a complete period of sinusoid, or harmonic oscillator (see Fig. 4). It manifests the self in the environment as a periodic oscillating system.

Identifying with periodical oscillations gives more possibilities to feel the balance between experimental “jumping to strange territories” (Zinker 1977, 31) in the action and contact phases, and integration in the withdrawal phase. However, the “creative leap” itself is not depicted by this periodic curve.
The preceding models of contact between organism and the environment (Fig. 3 & Fig. 4) show theoretically the accomplished relationships. They aim at analyzing the relationship complementarily to the professional therapy experiences. However, a steadfast attention to the models reveals the lack of theoretical connections between their constituents, and between each model and the practical experience. In order to cope with this inconsistency, more models of the contact cycle have been constructed (Clarkson 1989; Ginger & Ginger 1999; Bulyubash 2004; etc). For example, Lebedeva and Ivanova (2004) describe a contact cycle of Goodman’s together with Zinker’s cycle as fitting the first one (see Fig. 5):

- **Fore-contact** of Goodman, including *sensation* (Zinker 1977) and *awareness* (Zinker 1977; 1994).
- **Contacting**, including *mobilization of energy* and *action* (Zinker 1977), and *energy/action* (Zinker 1994).
- **Final contact** corresponding to *contact* (Zinker 1977; 1994).
- **Post-contact** or assimilation corresponding to *withdrawal* ([Lebedeva & Ivanova 2004, 137–149); (Zinker 1994) is added by the author of the current study).
Fig. 5. Comparison between relationship models of Goodman (1951; 1980) and Zinker (1977; 1994).

Making comparisons, the authors (Lebedeva & Ivanova 2004) concluded that any completed cycle of experience contains a series of subordinated tasks. For example, to make one choice between several desires, or to pick out one idea among a great number of them in the fore-contact phase, one should work exactly in the form of a few complete cycles of experience. Thereby, any contact cycle with a selected figure contains subordinated small-scale *fine cycles*. Fine cycles have many similarities with behavioral patterns, described by Fogel (1993; 2006). In addition, the “microgenetic research design” of A. Fogel (Fig. 2) is also similar to the series of the Gestalt-therapy sessions with a general result, expected by the client. In the Gestalt therapy, however, the fine cycles only become noticeable when the fluent current of the main cycle is interrupted (Lebedeva & Ivanova 2004, 145–147). Subordinated cycles, therefore, show a multi-scale and a self-similar, or a fractal structure of relationships between the self and the environment. The study of these cycles is the task of future research.

When the main contact cycle is actually interrupted, the fine cycle should be organized as the main one. Only then is it possible to continue the completion of the main Gestalt (ibid.). For a better understanding of relationships as a whole, it is necessary to study the interruptions of the relationship flow.
1.5 Interruptions of fluent organism–environment interaction

Interruptions of the contact flow, also known in Gestalt as resistances, are often described using biological analogies, and therefore they are too general in psychology. Interruptions keep the organism out of risky and even destructive changes. They do it by redirecting the activity energy from the contact flow. Resistance can be observed in any relationship flow on the nonverbal and verbal level (Perls 1973, 30–41).

**Introjection.** Interchange between the organism and the environment means energy-substance intake and outcome (food, air, mood, knowledge, etc.). Perls accepts the discrimination capacity of a contact boundary as a regulatory function of a psychosomatic organism. If discrimination works properly, the organism is healthy. If not, the organism-environment interaction, both biological and psychological, is destroyed. “We can only grow if, in the process of taking, we digest completely and we assimilate thoroughly. What we have really assimilated from our environment becomes ours. … But what we swallow whole, what we accept indiscriminately, what we ingest and do not digest, is a foreign body, a parasite that is making its home in us. It is not part of us… It is still part of the environment” (ibid. 32).

Perls (1973, 34) compares the psychologically introjected organism with the “house jampacked with other people’s possessions that there is no room for the owners property”. He insists on the necessity of careful processing of any psychological food coming from the environment. He picks out two dangers of introjection, damaging the contact boundary.

The first is business with the foreign bodies lodged in one’s self-system without a chance to develop oneself. In education, it can be situations in which the student accepts the teachers’ views and negates his/her own experiences. Offered information is mixed with the students’ own knowledge and student development is destroyed: “The more introjects he has saddled himself with, the less room there is for him to express or even discover what he himself is” (ibid.).

The second danger is more complex: it is swallowing of opposite introjections, which disintegrates the personality from inside. A sad example of an intrinsic disintegrating battle is when a student tries to use beliefs swallowed from the father – “never give up!” – and from the mother – “believe in people, they are all from God!” – when he meets the teacher’s unfair assessment. The student’s own position and intention is lost in a noise of a disruptive battle of foreign introjects.
Introjection is followed by the pronoun “I” when the real meaning is “they” (ibid.). It could also be “as if mine” unaware alien conviction, disintegrating a human from the inside. Sometimes feelings of guilt or loathing follow introject.

Example. Assume that a girl, playing with sand, was introjected by the superstition of her grandmother that “you are never allowed to be out of your group in kindergarten”. Then she could be interrupted, for example, while:

- following the tutor’s announcement to go in the arbor with guilt;
- searching for her need around or inside the arbor, narrowing its gratification inside the territory, occupied by the rest of the children, thus losing the play in the sandbox.

Projection. If introjection is the tendency to make oneself responsible for a foreign part of the environment, projection is the tendency “to make the environment responsible for what originates in the self” (ibid. 35). The luck of self-awareness shifts the contact boundary far to the environment. In an extreme case of projection, such as paranoia, a highly developed personal system of delusions makes a personal activity aggressive for the environment and the others. This person is not responsible for his/her own wishes, feelings and desires because s/he is not aware of them as his/her own. S/he is attributing them to the environment – objects and people. Thereby, further activity is carried out with alien objects or people in place of him/herself. Unaware intrinsic battle, therefore, is propagated out of the organismic domain.

Unhealthy projection is a widespread phenomenon in public communication. The self is unaware of the origin of the assumptions or fantasies or has no access to it (ibid. 35–36). For example, a teacher “feels” that a student avoids talking to her. The teacher is not aware of her own avoidance, based on her earlier traumatic experience with the big brother of the student.

Neurotic projection is a two-sided psychological phenomenon: one projects something to the environment or him/herself. The last has after-effects of fragmentizing the individual through disowning parts of him/her, making them “objective” problems, projecting them mentally to the environment. For example, a child, who made mistakes and has failed in the achievement tests, criticizes severely his eyes for missing the letters (ibid.). So projection is the way to avoid one’s own responsibility and to see the reasons in the environment.

Healthy projection is a clear assumption based on observation of the world and people’s behavior. The chess player makes assumptions on the thoughts of his
opponent using his mental abilities, but he recognizes that assumptions are only his own estimates.

Projection as a contact interruption uses pronouns “it” or “they” when “the real meaning is “I”” (ibid.). A projecting person usually moves towards the other and shows some expansive or aggressive gestures and behavioral patterns.

Example. If the girl intends to play with the sand, and projects to quarrelling boys “they will also fight with me”, or to the tutor “she does not permit me to go there”, she will not reach a shovel and will fail in playing with the sand.

Unhealthy interruptions have a common influence on the individual’s wholeness. Both cases – self-contempt (being introjected) and self-alienation (projecting) – embarrass self-identification: the self cannot obtain its own personal integrity. It is difficult to recognize, what is one’s own and what is alien. Any activity from these positions will be unsatisfying.

Confluence is the individual’s experience of no borders between him/her and the environment or the other. “Normally, we feel the self-other boundary quite sharply, and its temporary dissolution is consequently felt as a tremendously impactful thing. But when this sense of utter identification is chronic and the individual is unable to see the difference between himself and the rest of the world, he is psychologically sick. He cannot experience himself because he has lost all sense of himself” (ibid. 38). Feeling of lost boundary keeps oneself from contact with others and from meeting him/herself. The contact boundary is a condition of contact and discrimination of the individual organisms.

Neurotic confluence shows a partial or full (pathologic) incompetence of an individual in discriminating which needs are one’s own, and which are alien. Another person’s needs or goals become internal unconsciously of the other person or of a group in case of a permeable contact boundary. Such a person is not able to distinct his/her own hierarchy of needs.

Confluence with the other displays itself in the use of the pronoun “we”, without being aware of whose fact one means; his/her own or the other’s. Confluence is observed in unconscious parallel behavior and feelings of a couple or of group members without distinction of individual experiences.

Example. A girl turning around to find her need meets her best playmate busy with a doll in the arbor. Confluence with the playmate results in a common play with the puppet.

Retroflection – turning back the organism’s energy right after starting action “sharply against” the initial activity direction. Retroflection is an inappropriate use of the energy of the individual, intended to act in the environment but turning
the energy inside, in this way tensioning or even treating him/herself. Redirection of the intended activity inwards substitutes the individual organism himself in place of the environment as the target of his energy and behavior, as if it were the environment. The contact boundary will become rigid, if this kind of redirection is in regular use. The intended purpose will be lost.

Retroflection is manifested in use of “myself” in a series of unconscious statements like: “I have to force myself to do this job” or “I must control myself” (ibid.).

Example. Retroflecting, the girl may stop playing with sand even if she has already begun. For instance, after the tutor’s appeal, she will stop breathing for a while, stop the shovel movements and stop playing.

Under retroflection, there may be some other interruptions, such as projection, introjection. The investigation of interruptions is a specific task of the professional helper organizing the relationships. There is a brief description of all previous neurotic interruption phenomenology by Perls in one sentence. He portrays them as relationship disorders, which happen on the contact boundary: “The introjector does as others would like him to do, the projector does onto others what he accuses them of doing to him, the man in pathological confluence doesn’t know who is doing what to whom, and the retroflector does to himself what he would like to do to others” (ibid. 40–41).

In some cases, abortive actions are conscious and arbitrary, so they may be healthy.

Example. The girl knows that the tutor does not like it when the group is dispersed in the playground when it is time to go inside the arbor. Then she will stop the sand play on purpose not to be blamed by others.

A strategy of restoration of the boundary function is to reveal the contact interruptions. Psychotherapy or consultation is based on widening the awareness of connections between the intentions and actual behavior of the self. Links between intention, attention and awareness, the actual identification and the boundary activity of the individual are most important. They are necessary for the professional matching in teaching or helping relationships. This is why Perls emphasizes the “healthy loneliness” of the individual. However, sometimes loneliness becomes a manifestation of existential crisis, causing intention to find something which is the most important. Present models do not describe these features.

Perls (1969b) tried to find a solution and denoted a deepest subjective level of the self as the level of explosion. What is precious in the Gestalt therapy is that
the self becomes psychologically healthier by every step of awareness. Reorganizing the neurotic interruptions improves the intrinsic order, because it

- releases one’s “blocked” energy,
- integrates, organizes oneself into a new whole,
- helps to use less neurotic interruptions,
- sees clearer him/herself, the world, others, helps to meet them (ibid.).

Reorganization of the interruptions means widening the awareness of the self. It is realized by noticing intentions, attention orientations, feelings, impulses, emotions, and imagination (also known as middle zone). It is supplemented by widening awareness of one’s own behavior, self-connectedness to the others, world objects and events, happening at contact boundary.

Denial of the easy obviousness of events and widening of awareness leads towards the “essential self” and manifests “nonlinear thinking” (Clarkson, 1989, 1). It “aims for an integration of body, feelings and intellect” (ibid. 2).

The essential self (Clarkson) and the explosion level (Perls) have a common localization with the individual’s motivational center (Zinker). The motivational center could be a transition domain towards a higher complexity of man and human-environment connectedness.

However, the existential explosion level manifesting the essential self is senseless, if the individual rushes to self-sufficiency only. Moreover, any relationship experience research becomes senseless. Therefore, the Gestalt therapy of the last decade of 20th century involved the examination of relationships with others.

1.6 The interactive cycle

Zinker (1994) gave his first explanation of the Interactive Cycle after a thirty-year psychotherapeutic practice in the Gestalt Institute of Cleveland. He began the description by presenting his own rejuvenated Gestalt Experience Cycle, consisting of only five phases instead of the six he used before (Zinker, 1977):

- Awareness.
- Energy/Action.
- Contact.
- Resolution/Closure.
In order to understand what Zinker meant with oscillations of the cycle of experience, it is necessary to understand the very essence of creativity and change in psychotherapy:

“Each act of creation is like a unit of inhalation and exhalation. …Each therapy session has an intrinsic flow and structure… Therapy is a process of changing awareness and behavior. The sine qua non of the creative process is change: the transformation of one form into another, of a symbol into an insight, of a gesture into a new set of behaviors, of a dream into a dramatic enactment. Thus creativity and psychotherapy are interconnected at a fundamental level: transformation, metamorphosis, change” (Zinker 1977, 4–5).

Therefore, we can accept a cycle of experience as a general description of human creative transformation. Awareness is closely interconnected with the energy of relationship process (Zinker 1994, 65). This is the energy of creative discovery, and it differs from the energy of pure self-expression and from the energy of affective reaction.

**Phases of the interactive cycle**, named by Zinker similarly as contact cycle phases, do not coincide in the dynamics. The interactive cycle phases are more complicated and run differently through different parts of the human group, partly overlapping. Each phase includes elements of all other phases, similar to *fine cycles* (Lebedeva & Ivanova 2004).

Relationship phases are an important topic in our research. Therefore, we consider them in detail and separately from the previous contact cycles between the self and the world. Describing the phases, we imply any relationship participants, even when we use citations from psychotherapy. By *helper*, we mean the functions of any professional communicator, i.e. consultant or teacher, helping with relationship organization. We use play examples which are far from psychotherapy on purpose. We presume that awareness and mutual awareness are common for helping relationships and everyday life, but they are manifested in a different extent.

The *Awareness* phase is characterized by perceiving and sensing, contacting a person, and exciting about meeting novelty in the other. So “intrapsychic and interpersonal awareness exists before interaction” (Zinker 1994, 66). This is close to Bruner’s (1986) assumption of basic mutuality, of children’s competence of the other mind *ab ovum*.

Individuals in the interactive system alternate in two positions. Each participant is separate from the other one; each has his/her own perception, sensations, thoughts, experiences and awareness. Some of the inner psychological
events are difficult to explain or express. They can remain unknown to the self and to the partner. Nevertheless, some of the personal experiences can be shared with the other. On the other hand, interacting partners can arrange a common system with joint intentions, shared experiences and coordinated actions, directed towards a common need or result. One-system partners are turned to interaction coherently.

However, turning to interaction requires work (Zinker ibid. 67). This work includes two important sides:

- To explain to a partner clearly what is obvious to oneself only and to express one’s feelings.
- To listen to the partner’s perceptions, feelings, needs and to notice nuances of his/her conditions.

This clarifies similarities and differences between partners.

It is necessary to see the differences between two models of relationships – intrapsychic cycle (Goodman’s contact cycle or Zinker’s cycle of experience) between man and environment, and interactive cycle of Zinker (1994) between people. In the first cycle, the self should be aware only of his/her own intrapsychic intentions, needs, appetites, dreams urged to fulfilment. In the second interactive cycle, it is necessary to be equally aware of psychological phenomena of another person inside the interactive system.

Awareness energy in the first type of cycle grows after the discovery and awareness of the individual intention, need or aim. The main awareness energy of the interactive cycle is energy of interpersonal awareness. It only grows after each partner is aware of the psychological phenomena and needs of the other in the common system.

Increasing the specific awareness of each other “stimulates the energy necessary for the clear emergence of wants and desires: the emergence of a figure from the background” (ibid.). To organize the emergence of a human system’s common figure requires the special coordination skills of a professional helper. The task of the helper is to encourage partners to fuller self-awareness and to teach them skills of noticing, seeing, hearing the other; s/he helps to see the commonalities and differences, underlines their strengths and pays attention to interruptions.

Organizing mutual awareness is more complex than maintenance of active listening with cognitive interpretations of the other. Unfortunately, this type of
mutual awareness is hardly known in modern social psychology and the psychology of education.

The next specific feature of the interactive phases is that they belong to a system (a couple, a family, a group) as a whole: diverse and independent participants for an established holistic system are nonsense. But this system is not an amorphous multitude. The helper should exercise the skills to see them as an integer of a whole until the joint Gestalt is fulfilled. These skills help to follow the joint intention of a couple or group, meeting the common need or reaching the common result.

Interruptions of the mutual awareness in interactive contact at the first phase are specific. They are often connected with unskilled perception of the other and lack of self-awareness. Inexperienced couples or group members often show introjection and projection.

The helper’s task is to become a natural part of the system, and to use interruptions as a chance to intervene into the system. S/he widens the awareness of the participants on resistances, returns responsibilities for self-perceptions and organizes awareness (ibid.).

Example. Two girls, Tanya, 7 years old, and Lyuba, 5.5 years old, agree to play “Mothers-and-Daughters” (traditional Russian pretend role play). Tanya is “a mother”, she ties a scarf on her head, and begins to “prepare breakfast” for “a daughter,” who will go to school after breakfast. Tanya does not notice that her playmate, Lyuba has a self-image of “a daughter who has a puppy” and she is not a schoolchild at all. The girls persist in their roles for a while (mutual interruptions); their self-expression energy grows, but mutual awareness does not appear. After a dispute and a pause, the “mother” agrees to be “a mother of a girl playing with a puppy”. For the “mother” it does not matter whom she will feed, but for the “daughter” it is extremely important to have a puppy in the play. When they accepted one another, they begin a joint role-play. The mutual awareness phase is fulfilled.

The Energy/Action phase in interactive cycle has a qualitative difference from the contacting phase of the intrapsychic cycle: a figure of wants and desires appears by common efforts of a couple or group. The common “energy becomes invested in a dominant interest” shared by the couple or group (Zinker 1994, 70–71). There are other small differences also. “A shared figure for all members of the system” (ibid.) appears after a lot of mutual adjustment work of the system members. Usually, the individuals of one system have different aims and different ideas on how to achieve them. The task of the helper is to actively manage the
complexity of these differences through negotiations inside the system so that the awareness in the system will invest energy in a common figure. Experienced couples or groups show a balance between pushing and patience, which transcends differences into a common figure (ibid.).

The helper’s skills embrace support and respect of the others and many active and receptive skills: creating, suggesting, influencing, enticing. S/he also manifests openness to being influenced, interest in suggestions, supports creativity in the others, allows to give and take, to combine seriousness and lightness, etc. (ibid.). The metaphor of this phase is “playful fights. Everybody gets workout but nobody gets hurt” (ibid.). At the end of this phase, the system members find a common activity towards a common figure.

The cycle interruptions are usually of two types. *Confluence* manifests itself interpersonally as losing borders between one another. It happens when the balance between the mutual influences in a couple or group are deposed for the benefit of one, so that it makes the other(s) agree silently with the dominated but not shared figure.

*Retroflection* – turning one’s energy of action inside oneself – keeps the partners’ contact boundaries in interaction without contacting one another, even if some activities have already begun. The partners are inaccessible to one another. A common system is going to become static, where the partners are also isolated from the external world.

The helper’s skills are directed at organizing a balance in the clients’ presence in interaction system between his/her accessibility and impressiveness (Bugental 1987, 26–27; Lebedeva & Ivanova, 2004, 337–348).

*Example.* Tanya and Lyuba agree that when the breakfast is ready, the “daughter” (Lyuba) will get up from “the bed”. But suddenly the “daughter” says with trolling that she must take her puppy for a walk early in the morning, so the “mother” must wake her before (trolling again) breakfast, so that she could walk first. Tanya looks at Lyuba for a moment steadfastly, stopping her “mother” play activity, and breath-holding. Her gaze tested, if the “daughter” plays a role indeed or she just continues to persist. The “daughter” see Tanya’s perplexed and suspicious face in this interruption, and after a pause goes “to sleep”, restoring the play. Tanya breathes out, resolving her sudden retroflection and goes back to play the “mother”.

The *Contact* phase produces an active awareness of difference (novelty of other) at the boundary between the self and the other. This is a culmination point, manifested in both kinds of contact cycle as “a lively process of stocking the
client’s inner fires of awareness and contact” (Zinker 1977, 24). This is the place- and-time of a “revolutionary molding” realization, a creative leap, “the culmination of one’s clinical hunches and outrageous inventiveness” (ibid. 29). It is an encounter, a behavioral jump “to strange territories” (ibid. 31), breaking the old rules in order to experience a novelty, and to make a new enlivened agreement about it.

The energy of excitement with the other is combined with heightened attention, and with dynamic alternations of accepting or rejecting of events appearing at the contact boundary. The common interactive figure is created as the integer whole of former parts. A couple or a group has a sensation of a mutual ownership of a whole, which could not be presented as a pure sum of the parts. The sense of mutuality helps to see the differences much better, improving the effectiveness of the interactive cycle.

A strong contact generates enough energy to carry out the agreements and to meet them totally. The mutual creative adjustment goes on with its fullest power after the discovery of the novelty of the other. The helper’s task is to facilitate any manifestations of healthy mutuality and the partners’ mutual movements toward each other respectfully. The helper also works with mutual resistances and interruptions.

A poor contact usually keeps resistances, such as confluence and/or retroreflection, from lowering the energy level and preventing to complete the cycle: a common figure has not enough power because of weak involvement of some of the participants in it. A group or a couple in confluences overestimates fast agreements, avoids constructive conflicts inside a system and loses the novelty effects. Creative adjustment, if it happens, goes poorly and looses the transformative potential.

Example. Tanya: “Da-a-ughter, sta-a-and up, it is time to go to walk the puppy-y-y”. Lyuba: “U-h-h-h, it is too early!” Tanya, as a puppy, yelps cheerfully several times. “Daughter” stands up suddenly, jumps smiling two-three times and joyfully leads the imaginary puppy “to the park”. “Mother”: “Do not allow him to bite passers-by! And come back fast, breakfast is almost ready”. Lyuba nods gazing at the pretend puppy: “Yes, mum!”, and runs to the “park”. The girls are involved in the play totally, are steady in their roles and do not interrupt the play interaction.

The Resolution/Closure phase is a qualitative turn to feedback. A couple or a group checks common agreements and understanding in all the events which just happened and are going to be completed. This is the system’s intrinsic feedback,
which will have decisive influence on further relationships of the couple or the group with the world and with the others outside the meeting with the helper. They express thanks to one another for the common results and pleasure and also check and accept hardships and misunderstandings.

They also give feedback to the helper and it is a particular feedback until the next common relationship. The helper, while meeting the client’s report-making activity or depreciation of a previous job, should exercise care. These two phenomena are different types of losing the balance between the responsibilities of the client and the helper.

The helper manages the interruptions, for example, facilitating self-expression of that phase or shortening too long conversations.

*Example.* The “daughter” with the imaginary puppy comes back “home” and begins to explain the puppy’s behavior, licking her all over, jumping to her hands, not biting passers-by, and barking at a cat. The “mother”, concentrating on the food offers porridge to the “daughter” and milk to the “puppy”. Lyuba, stroking the “puppy” and trolling “Our mother is so lovely!” gives feedback to Tanya about enjoying the play.

The **Withdrawal** phase is the end of the interactive cycle. The cycle shows here the last impressions of the client, often like “I don’t want to say anything more” or “Thank you, I should stay alone with that”. The cycle goes naturally to the end when the participants of a system separate from one another and turn inward, letting everyone to do the same – letting them be. But the interactive cycle also accentuates the boundaries between a couple (a family or a group) and the external world. It means that a couple (family, group) system keeps the connections of the whole even in the withdrawal phase and separates more from the helper than from one another.

This phase is usually the initial turning point towards the next event. And the helper coordinates too long or too quick a turning. Too quick a turn towards the next event may interrupt an important subjective part of the withdrawal phase; assimilation and integration, or the **impressive phase**, observed by Ivanova & Yakovlev (1996). It is a sub-phase of immersing inside of oneself, needing some attentive protection in counseling and in education.

*Example.* Tanya: “You have got a good puppy!” Lyuba: “It was a tasty porridge, with strawberry jam! I like it!” And, turning to the puppy: “Let’s go to the puppy’s school. They will teach you everything a good dog must do”. The girls both look out of the playground for a while, it seems, losing interest in the play. Tanya: “By-e-e! I’m going to my work now!” – and she goes slowly away.
Lyuba notices something outside the playground, and runs away. Tanya just follows her with her eyes, shouting: “See you!” – Lyuba: “Bye!”

Contact cycles and the interactive cycle have various boundary dynamics and interruptions. They both show that the Gestalt approach has a good potential for the phenomenological description of relationships beyond psychotherapy. But the examined relationship notions also have weak points for several reasons. Firstly, simultaneous use of physical and biological Gestalt analogies combines atomistic (Freudian) methodology with the holistic one. It shows a lack of proper scientific methodology. Secondly, there is a shortage in knowledge of the self, involved in contact with the environment, and of those who interacts and how controls this interaction.

Thus, it is necessary to have more knowledge of the self – its structural and functional peculiarities. Nowadays, the theory of the self is not in extensive use. But from our viewpoint, it has an undiscovered scientific potential.

1.7 The theory of self

Perls (1969a) and Goodman (Perls et al. 1980) created their own theory of the holistic sage-organism-in-the-environment, or of inter-organismic integrity (Lebedeva & Ivanova 2004). From their viewpoint, the subject is not a biological organism nor the environment, but events on a contact boundary between psychosomatic organism and the environment at the “organism-environment field” (Lebedeva & Ivanova 2004, 122). In this framework, the contact boundary is a multidimensional space.

We already mentioned above that the Gestalt approach discerns two types of contacts between the self and the environment; conservative self-regulation and creative adjustment (Ginger & Ginger 1999; Lebedeva & Ivanova 2004). Nowadays, there are a number of phenomenological definitions of the self. It was Paul Goodman who first introduced the idea of the self to the Gestalt-therapy (ibid. 124). He defined the self as a continuous process of creative adjustment of human to his intrinsic and extrinsic environment. Perls, however, discussed the first two functions of the self in his book “Ego, Hunger and Aggression”. The organismic functions called Ego- and Id-functions (Perls 1969a, 138–145) illustrated the contact-boundary activity (ibid.). Some connections have been found between the Ego-function and the Personality-function. Most of the definitions of the self are manifesting nuances of the process of individual activity in contact (Lebedeva & Ivanova ibid. 122–125).
Let us briefly consider the functions of the self, or in other words, the sub-structures or the regimes of self-functioning (ibid.). It is convenient to view them in the order of their natural manifestation in the relationship flow. Therefore, we start from the two self-functions; the Id-function and the Personality-function.

The Id-function was included in the theory of the self according to the Id of Freudian psychoanalysis, where it contained the spontaneous energy of the libido and was controlled by the Ego. In the modern Gestalt therapy, the Id-function of the self manifests nonverbal expressions of life energy. It expresses conscious or unconscious current needs and preferences of the self (Ginger & Ginger 1999, 120–121). The Id-function is observable through a wide range of continuous psychosomatic phenomena. It presents the self-energy expressions in general: intrinsic impulses, feelings, and basic vital needs with their nonverbal correlates (ibid.). They are manifested in blushing the skin or hunger, respiration rate changing or appetites in a broad sense (Lebedeva & Ivanova 2004, 125). It is considered, although this is not obvious, that a person is not responsible for the manifestations of the ever-changing Id-function: s/he decides to satisfy it now and finds it difficult to postpone or to refuse it.

The important role of the Id-function is changing the process of a relationship. Therefore, the nonverbal dynamics of the self-energy mould the relationship flux.

The Personality function of the self is the most stable one. It presents the current self-concept of a person. On one hand, it is responsible for the integration performance of running the life experiences and for structuring the activity (Ginger & Ginger, ibid.). On the other hand, it manifests a chosen mode of integration from the spectrum of possible modes; life-long roles and positions of the self, fit for the current situation. It can be described as “now I am that person” or “I am in that role, position now” (Lebedeva & Ivanova 2004, 126–127). This function is a cognitively oriented constituent of the self, a chosen self-structure fit for the current event. It has a tendency to find the center of the individual, responsible for centripetal modes of integration (Zinker 1994, 119). These theoretical efforts lead to the Ego-function.

In the modern Gestalt approach, the Ego-function provides the aware contact or withdrawal between the organism and the environment, consent or denial of the self for contact, and responsibility for the choices (Lebedeva & Ivanova 2004, 126). In spite of the central role and connections with awareness, the Ego-function’s phenomenology was for some reason limited to making the choice to contact or not with the environment, or by the control of boundaries behavior. Interruptions of the Ego-functioning, therefore, are known as losses of the Ego-
function, or as the Ego-defense mechanisms, resistances or avoidances (Ginger & Ginger 1999, 126–139). Many of the Ego-function constituents considered by Perls, thereby, are missed in the modern concept.

Presumably, considering Perls’ original Ego-functioning in more detail will help to elaborate it in the contemporary Gestalt theory.

The Ego-function of the self is responsible for the healthy or pathological identification of the self with the world, with another human or with a group. But it is not clear, who identifies. Perls represents identification as a function of the lungs, being “abstract” but doing the exchange of gas and vapor between the organism and the environment (Perls 1969a, 139). Thus, the Ego becomes “similarly a function of the organism” ceasing without awareness, for example, during sleep and coma (ibid.).

Perls agrees with psychoanalyst Federn on the spatial activity of the Ego, but rejects his substantial notion of the function. In contrast with him, Perls, however, is interested in the substantial ability of the Ego to oscillate; to expand and to contract, to stretch into the environment and withdraw into the self-boundaries. He presents the Ego-functioning as a movement on the two-sided boundary, defined as “the places of contact” (ibid. 143). Meeting a foreign subject, the Ego starts multiple functions: they “come into existence, determine the boundary between the personal and impersonal «field»”. Functioning includes the integrative energy and the simultaneous appearance of defense and destruction (ibid. 143–144).

To understand this process it is necessary to imagine what Perls means describing the Ego as “coming into existence merely in contact”. Describing “places of contact”, Perls suggests a cell membrane analogy. This notion is convenient for therapy practice. But a cell has an actual – not abstract – boundary all the time of its existence against other cells around it. It cannot satisfy Perls’s “abstractness” of the Ego-function.

Perls presents the Ego-function as a method of imaginative (not neurotic or psychotic) identifying oneself with the object of identification, e.g. mutual identification of team members. The identification should be combined with “more or less pronounced hostility”, such as love as identification with an object and hate as alienation from it.

The two sides of imagination (fantasy) is an important aspect in Perl’s theory. Identification through imagination (the core of the Ego-function of the self) adjoins with his idea of cognitive fantasies as a dangerous way to lose the reality.
Therefore, the cognitive domain in the Gestalt is not elaborated. Moreover, the avoidance of fantasy and use of “as if” identification is theoretically inconsistent.

Perls points out the existence of two kinds of Unconscious in the self – biological (in the philosopher’s, Hartman’s sense) and psychological, when he focused on the central role of the Ego-function. He emphasizes that the Ego “is not identical with the whole personality”. The Ego gains essentially central localization in the theory of the self: like a general, commanding an army, the Ego-function is “a part of, but apart from the rest of the army” (ibid.). The subordinated psychoanalytic Super-Ego and Ego-ideal also perform identifications, confirming the core level of the Ego-function. Thereby, Perls wants to affirm that for a healthy personality “identification is an Ego-function” (Perls 1969a, 139–141).

Consequently, the Ego-function is based on the core process of metasystemic identification. It is also responsible for the achievement of subjective integration, or “feeling that something is part of him or he is part of something else” (ibid. 140). Perls opposes the “vertical” position of the Ego-function of the self with the psychoanalytic notion. He describes the constituents of the central function in a series of polar oppositions to the Freudian ones. The Ego is:

1. A function (versus a substance).
2. A contact function (versus a confluence).
3. Responsible for a figure/background formation (versus de-personalization and dreamless sleep).
4. Elusive (versus stable).
5. Active, interfering (versus organismic self-regulation).
6. The awareness of the self (versus awareness of another object).
7. The instance of responsibility (versus the Id).
8. The boundary phenomenon itself (versus the object, having a boundary).
9. Spontaneous (versus dutifully attentive).
10. A servant and executive of the organism (versus master in its own home).
11. Appearing in the ectoderm (versus mesoderm and endoderm).
12. Identification/alienation (versus the feel of indifference) (ibid.).

There are some inconsistencies in the suggested oppositions. Function and substance (1), which Perls illustrates with an analogy of lungs, cannot be oppositions. There is no breathing function without air substance in the lungs and blood substance in the organism. In addition, neither the air nor the blood appear in breathing; they are constituents of the breathing function, evolving billions of
years. Therefore, it is incorrect to refuse the substantiality of the Ego-functioning as Perls did with Federn’s viewpoint. It is not logical to draw comparison between identification/alienation function (12), which makes both the polarities in (6) – awareness of the self and awareness of another object or person – possible. The mutual awareness in the interactive cycle clearly demonstrates it. It is difficult to integrate the Ego-function features like instance of responsibility (7), on the one hand, and elusive (4) and spontaneous (9) function, on the other hand. In addition, the Ego-function as a general commanding an army and a servant, executing organism (10) is paradoxical. But we cannot say impossible, because the Ego-functions are the result of long professional research of relationships. This prompts further theoretical research on the Ego-functioning, which shows peculiarities of the self as an open system.

1.8 From abstract “as if” connection to experience of connectedness

Perls focuses on the idea of the Ego as on “similarly a function of the organism” (ibid. 138) in the form of boundary activities. The Ego commands the motor system (ibid. 139). However, he also outlines a metasystemic position of the center, mentioned in the previous sections [“a general, commanding an army is a part of, but apart from the rest of the army” (ibid.)], which he does not argue. Is it possible to be “similarly a function”, and to be responsible for the substantial “army” of the concrete psychosomatic self at the same time? Perls does not give the answer, but tries to elaborate the problem.

The basic task of learning and therapy, i.e. integration of subjective change, is based on identification (ibid. 140). A healthy personality accomplishes identification as Ego-functioning, following the current situations. Pathological Ego-functioning ignores the changing environment.

Opposing two psychoanalytical theories – Freud’s and Federn’s, Perls has difficulties with the term “identification”, “which has different aspects, e.g. copying somebody, siding with someone, concluding that two things are the same, sympathy or understanding” (ibid. 141). However, in his further account he does not define it.

The integrative Ego-function, however, is well elaborated and solves “administrative tasks” of connecting the actions of the whole organism (ibid.). The central functions are responsible for the following tasks:
To call upon functions, necessary for the gratification of the organism’s most urgent needs.

To direct all available energies to the service of urgent needs (ibid. 146–147).

Perls shows some vagueness in the Ego-function. First, is bi-functional Ego a master or a servant of the organism? Second, the function is a “middleman with many responsibilities” (ibid.), but is this possible without answering the previous question? Another question is hidden in the remark about the beginning of “free will” inside the identification/alienation function (ibid. emphasis added). This question is partially answered in Sartre’s thinking where responsibility is transformed into self-responsibility for the choices as the main manifestation of the Ego-function in the modern Gestalt-therapy.

The findings listed above help to consider the Ego-function as existential. However, Perls confirmed his existential-holistic devotion, saying that “holism requires internal peace” (ibid. 150).

From Perls’ further description of the Ego-function, it becomes clear that he, unfortunately, insists on its abstract operational “as if” identification. He digresses from his existential and holistic position when describing the object of identification outside the personality (ibid. 142–143). Considering a simple example of Mr X seeing a house, Perls says, that Mr X identifies himself with the optical system: “He identifies himself with this system of his” (ibid.).

We suggest a short thought experiment, following an “as if” identification process, described by Perls. There are more than three “objects” in that identification:

- “He” – Mr X, who is doing the identification, “Himself” – the personality of Mr X, subjected for the identification;
- The optical system of Mr X (not obvious – which one’s: his or himself’s), helping to identify in the optical connection;
- A house, which Mr X (still not obvious – which one) sees.

In the case of an abstract “as if” identification, the following steps appear: “He” “as if” identifies with “himself” . “Himself” (equal to “he”) “as if” identifies with the optical system, also diverse object. The optical system, in its turn, somehow “as if” identifies with the house. When the house, after a chain of abstract “as if” identifications will come back to “He” or “himself”, in what extent of abstract identification will it be a “house” – “as if” of “as if”? Even if the linear chain of
abstractions is shorter, *who specifically* is able to realize the identification/de-identification (alienation) process?

The phenomenological position, accepted by the Gestalt theory and therapy, determines that any perception, feeling, action or awareness is *specific* and *embodied*. This is a position of the phenomenological philosophy, too. Therefore, Perls’s “as if” identification leads to a confusion in the Gestalt theory.

Another intention of Perls’s was to divide the self to “He” and “himself” and the second one shows some important *instrumental* features of the self. Then the “He” becomes a center of event, coinciding with “the I”. When “He” identifies “himself” with an abstract optical system, how does “He” do it? How can “himself” identify with the house, if the identification is merely an abstract “as if”? “He”, then, only needs the optical system, and the “himself” is unnecessary. Probably, the identification is not so abstract as Perls proclaimed, and the “him” could be clarified.

Perls tries to understand identification as a kind of influence. He finds that unhealthy “double identifications”, for example, denote a possibility of a person refusing undesirable identifications (ibid.). Thus, another function of the Ego and its development as “*selector or censor*” arises (ibid. 146; emphasis added), and is becoming more popular in the modern Gestalt approach.

One more example shows the inapplicability of a separate “as if” construction. Perls’s own description of identification/alienation as boundary movements contains an example:

“A healthy Ego-function *answers the subjective reality*, and the needs of the organism. If, for instance, an organism develops hunger, food becomes “gestalt”; the Ego identifies itself with the hunger (“I am hungry”) and answers the gestalt (“I want this food”)” (ibid. emphasis added).

In this example “as if” identification with food, substituting the actual organismic state for an abstract essence, “the hunger”, and substituting the food for gestalt are a total nonsense. In the Gestalt view, the third essence – the hunger itself or the gestalt itself – are not necessary. There is a real hungry self, charged to act and some central function, working with the specific subjective reality, experiencing and realizing it.

Perls describes *resistances* as functions of the contact boundary. He uses two experientially proved, mutually interrelated and polar processes of boundary functioning: identification/alienation and widening/stretching boundaries. He understands resistances as a specific *dysfunction* of the Ego and again turns to the holistic view. Therefore, in opposition to Freud, resistances *“are not an evil, but*
are rather valuable energies of our personality – harmful only when wrongly applied. … The dialectical opposite to resistance is assistance” (ibid. 153).

Consequently, identification/alienation of the “I”, widening/stretching of boundaries and resistance/assistance of the self are consisted in the Ego-function dynamics. However, Perls does not pay much attention to synthesizing the clear oscillating features of the central functions of the self.

When Perls turns to a holistic explanation of the perception of experience (he does not use this specification) and calls it activity between the organism and the environment, he lost interest in “as if” abstraction. He affirms the holistic inseparability, saying “in reality there is never such a thing as an individual or an environment. They both form an inseparable unit in which, for instance, stimulus and readiness or ability to be stimulated cannot be separated” (ibid. 200; emphasis added).

The combination of “as if” abstraction with the experience of an inseparable unit, by Perls, make a “forced concentration”, which “leads to neurosis” (ibid. 189). In other words, imagination separated from the experiences of connectedness generates a “double bind” phenomenon. Unfolding the feeling of contact could be just an “as if” feeling of contact, but not feeling it indeed (like feeling yourself). Then the contact is not actually on “my” side of the contact boundary, but on the alien, “external” side, and I have no means to make actual connection. Thereby, a contact boundary is splitting into two different natures: real on my side, and abstract on the environmental side. Alternatively, if the boundary has a real nature, and we need to intertwine the contact feelings with abstraction, then we feel it (because a world is real) and do not feel it (because it is mere abstraction) at the same time.

The existential-holistic orientation happens to be a contradictory combination with individualism of the classic Gestalt (Wheeler, 2000). Perls paradoxically expresses this contradiction in one paragraph of his book. First, he expresses extreme distrust to subjective reality in a form of the positivistic motto:

“Thinking in four dimensions in accordance with outside world, coupled with the ability to distinguish between internal and external reality, is a basic requirement of mental hygiene”(ibid. 206; emphasis added).

Second, he expresses a desperate opposition with the previous statement, turning to experiential comprehension through awareness:

“Self-realization is only possible if “time-space awareness” penetrates every corner of our existence; fundamentally it is the sense of actuality. The appreciation of the identity of reality and present” (ibid. emphasis added).
Thus, Perls’s theoretical toss between the abstraction of contact and the experiences of connectedness can be expressed by asking:

How is it possible to identify with actuality and not to identify at the same time?

Perls’s incomplete relationships with the wholeness of self-environment connectedness has made some milestones. He outlines a central role of the Ego-function in the boundary oscillations and identification/alienation. The consistent holism is an actual whole-with-us as a pre-send matter of fact, a basic axiom for the holistic doctrine. Therefore, the previous double bind question can be transformed in the following way:

How is it possible to identify with the whole actual event, and to retain one’s own identity and wholeness?

We can look for the answer in Allport’s view: “the fact that the units we seek are invisible should not deter us” (Allport 1981, 128). Therefore, in the next section of this study, we will focus on certain details of the theories which are usually overlooked. However, we will take into account experiential evidences of examined details, and retain the holistic position in the research.

Summary

The phenomenology of human relationships in the study of child development is heterogeneous. The concept of the Zone of Proximal Development of Vygotsky can be interpreted by connecting it to emotionally charged dramatic collision between real and ideal forms in relationships. Vygotsky (1978; 1984) found the role of drama in human development in the psychological approach of Polizer (1980). How is this drama intertwined with the relationship flow? How to describe the phenomenological dynamics of subjective change brought about by dramatic collision?

J. Bruner’s (1985) study on children’s communication reveals the role of meaning in interpersonal communication. But meaning making has a pre-linguistic experiential basis, a sense of mutuality.

A. Fogel also presupposes that there is a basic connectedness between humans. He argued for the dialogic self as a basic developmental factor in mother–child dyads. He elaborates a systemic-informational approach to occasional relationships “as they happen”. Looking for a solid basis of structure in
relationships, he focuses on attractors inside the human being as representatives of patterns in relationships. But he did not notice some contradictions between the location of patterns and the nature of the system of relationships. He did not see the contradiction between linguistic and pre-linguistic mother-infant agreements. Nevertheless, he makes significant contribution to revealing the dynamic system phenomenology of relationships as the unity of a process and a pattern built by co-regulation, agreements, matching, interactional synchrony and mutual creativity of participants.

Helping relationships express a different but complementary view of interactions and change.

The Palo Alto research group led by Bateson presents a system-cybernetic view of relationships. They observe the general phenomenology of human relationships as an open system. They observed tendencies and processes in dyadic adaptation of participants. They used meta-communicational axioms in the description of basic phenomenology of relationships. However, the axioms are formulated in a strict cognitive frame, which does not help to understand emotional process in relationships.

In developing holistic Gestalt-approach to relationships Perls, Goodman and Zinker use simple phenomenological models of harmonic oscillations to describe a growing awareness and subjective change of an individual. Accomplished event in relationships presents in the form of process flow oscillations the oscillating complete pattern; Gestalt. These relationship oscillations contain centralized contact functions of an individual and a group, as well. Safe “playful fights” in transferring personal differences into a common figure in interactive cycle flow resemble a dramatic collision in ZPD that causes a developmental change. The continuity of relationship flow depends on awareness in the case of human-environment relationships, and more on mutual awareness – in the case of man-man relationships. The complete Gestalt means integration of new experience and new intrinsic order in participants. Interrupted relationships imply the breaking of oscillatory flow of energy in contact. It is necessary to overpass the contradictions in theory, for instance, between cognitively restricted descriptions of oscillatory self-functioning and holistic experiencing of contact oscillations. In order to develop the Gestalt-approach models of contact to dynamic analytic units of relationships it is necessary to pay more attention to theoretical details.

The cited authors all referred to some qualitative irreversible changes, alternations of stability and instability in the dynamics of human relationship systems. They demonstrated how activity and passivity alternate keeping integrity
and order in participants. Therefore, it is also necessary to analyze these inexplicable features in relationship systems, which often escape the attention.
2 Dynamic processes in relationships

We believe that the applied theory of helping relationships has potential, which can help to develop the general theory. We suppose that certain aspects of the notions of relationship help to enhance the dynamic modelling of relationship and to use the nonlinear methodology.

2.1 Dynamics of reference frame

Perls does not discuss the “vertical” position of “the I” (Perls 1969a), which creates a connection between “a general, commanding an army” and the self “apart”. He does not pay attention to the dynamics of reference frames. Connections of “the I” to the self, or “He” and “himself” are transformed to undifferentiated “self as psychosomatic organism”. The same happens with the pairs “identification/alienation” and “widening/stretching” of self-boundaries.

Perls (1969a) writes about reference frame of time. He writes, that the actual experiencing and acting has to be seen always “from the bearing of the present” (ibid. 208). This is a basis for realizing oneself as a “time-space event” (ibid.). It is not sure, however, if he means the classic time-space notion. In the boundary descriptions Perls uses Cartesian notions. But when he describes attention concentration and awareness in subjective change, he goes beyond the classic notions (ibid.).

In the Gestalt-therapy session being at present is combined with being identified with different reference frames, and being aware of experiences from alternative positions. In these subjective reference frame movements, identification alternates with alienation, and each time the self returns to its own reference frame. In a proper awareness organization, a subjective change takes place. Therefore, the dynamics of a subjective reference frame is theoretically very interesting.

The positivistic reference frame in academic psychology is composed of exterior observer data collected following the ideals of classical physics. However, A. Einstein proved, and modern psychotherapy accepted that:

- No reference point is more real than another.
- Any movement in space is always relative, and can be perceived only in relation to something else.
There is no empty box of some ready-made space before our lives and before activity in the Universe (cit. by Dilts 1993; emphasis added).

The relativity of reference frames means that different data and experience are attained from different points of origin. The data or experiences from unmatched reference frame are not true. Any movement, perception and relationship is possible from a specific reference self. Therefore, experience and perception data are only true to the system or specific self, subjected to the perception and experience from this specific reference frame. Alien statements about “true” data or “true” experience become senseless, because each “data” we obtain from within the here-and-now reference frame, is phenomenal empirical. For the phenomenal time-and-space event, connected to the specific reference frame, it is better to use the “kairos” type of time rather than linear “chronos” (Stern 2004, 7–8).

Perls experientially discovered, that being with actual event, “you will soon learn to realize yourself as a “time-space event” (Perls 1969a, 208). Thus, each observer gets his/her own reference frame with the observer’s current identity. Identity is holistic involving phenomenal perception, experiencing, imagining, awareness and action. The phenomenal experience of each self is self-sufficient. This situation makes responsibility for psychological facts of self in the Gestalt therapy understandable. If there is a “larger” space (Dilts, 1993), a metric comparison of system sizes is not relevant from the current viewpoint. It is another reference system revealing different phenomenal experiences in the frame of some new relationships.

A “larger” relationship system integrates constituents of different possible related viewpoints or reference frames. A “larger” system from the point of view of nonlinear dynamics is a system that is more complex than its constituents. “Smaller” systems could not be put inside one individual reference frame, just as individuals in a couple could not be put inside a couple. They can only be interconnected constituents of a “larger” system (ibid.). Therefore, “smaller” systems will inevitably be subjected to the influences of “larger” systems by means of getting a new reference frame, a new mode of perception, experiencing and action.

To be involved in relationships and to participate in the actual experience of the other is possible merely by sharing the reference frame of the other. It means that one’s reference frame identifies with the reference frame of the other.
Common system identification forms a joint reference frame, too. But if the reference frames do not coincide, the experiences of the other are alien.

In relationships, **coordination and new agreements** are key phenomena in creating a **joint system** (Fogel 1993; Zinker 1994). They keep boundaries of constituents healthy, and identify them with one another by attunement (Stern 2003). They manifest in common ground (Zinker ibid.), basic mutuality (Bruner 1986) and existential meeting (Buber 2000) in long-term couple and family relationships and in the energy of attunement (Zinker ibid.).

This is a possible theoretical explanation of the identification/alienation process taking place in holistic reference frame movements. The mobile origin of the subjective reference frame can be explained through relational “being with” or “being without”. Being with is much more responsible, sensitive and profound, and allows enriching through new experience. In being with or without, no reference frame is more real than another (Dilts ibid.); they belong to a common reality. This is why make believe imagination and cognitive activity are particular cases of holistic being with. In general, they are subordinated to holistic experiential comprehension. Only then will the penetration of one’s existence by time-space awareness (1969a) be actually possible. The activity of the Ego-functions inside and outside the self-boundaries is only possible with the concept of mobile reference frame. In combination with the awareness of the current experience it organizes a subjective change. How does it happen?

### 2.2 The self-center and a subjective change

A practical answer to the question of subjective change is easier in the Gestalt approach than a theoretical one. The Ego-function has a complex, multifunctional character and it is tied to many inner self-constituents. Only a few aspects of the self-functions – Id, Personality and Ego – are dealt with (Ginger & Ginger 1999; Lebedeva & Ivanova 2004; etc). The genesis of the intentional acts of the self – its intrinsic exertion, starting subjective dynamics – does not have a clear theoretical explanation. The incomplete Gestalt is reduced to biological urgent need because details of the work of awareness, the aesthetical view of Gestalt and the role of imagination are ignored. In the last chapters of his first theoretical book, Perls forgets the theory he developed in the first chapters (Perls 1969a). The paragraphs “Sense of actuality”, “internal silence”, and “first person singular” contain descriptions of his phenomenological therapeutic experiences. Correct Ego-language and correct identification are provided with the responsibility of the
undifferentiated first person singular position (ibid. 219). The author probably did not know that the idea of the first person singular is theoretically in close accordance with Einstein’s relativity and the “Galileian mode of scientific thought”, elaborated by K. Lewin.

Later on, the Gestalt-therapy established experientially that the Ego-function becomes active for the first time in the contact cycle only after actualizing the Id- and Personality-functions of the self. It performs a choice making functions. Therefore, it is possible to assume that the origin of the subjective change is related to the Ego-function. For this purpose it is necessary to understand better the relations between Ego or “the I”, the Id-function and the Personality-function of the self.

Unfortunately, the Id- and Personality-function are not theoretically well known. On one hand, the self has no clear structural correlates showing the origin of the awareness reference frame. Therefore, we cannot describe the need and its dynamics well. On the other hand, there are many attempts to demonstrate theoretically the relative sufficiency and importance of self-center compared to the peripheral self-content inside the self-boundaries. A theoretical survey might help to understand the self-functions subordinated to the self-center.

First, Perls placed the Ego-function in the center of the self and identified it with “the I”, “the general of an army”. In systemic language, the complex Ego-function is the metasystem for the rest of the self-system.

Second, two theories have influenced the development of the Gestalt-therapy. The first is existential theory of paradoxical change, developed by A. Beisser (1970). Personal change occurs by accepting who a person is, not by trying to be someone else. This explanation is based on a process of self-accordance inside the self-boundaries. But the theory does not describe a dynamic structure, which allows self-coincidence. This theory was born from the attention concentration practice in Gestalt-therapy and its everyday practical results, i.e. subjective changes towards better self-accordance in clients.

To recognize one’s true intention, it is necessary to suppose two points of reference at least: one – the origin of intention (and of the self), and the other one – a target of intention. It is necessary to suppose that the self has its own intrinsic field dynamics (Lewin 1951; Parlett 1991; 1997), and some inside-self degrees of freedom. With a mere outside-boundaries degrees of freedom, Beisser’s theory does not work; the coincidence of the self-origin with one-self will never happen because of the absence of any relational movement of the self-structures. On the contrary, if some relational movements between the self-structures take place
inside the self-boundaries, and then self-accordance is possible, and according to Beisser, change will happen. The last assumption also agrees with the principle of relativity: the only true experiential knowledge comes from the reference frame coinciding with the observer.

Another existentially oriented theory is Bugental’s (1987) theory of the primacy of subjectivity:

“I believe that the new paradigm – for psychotherapy, for psychology, for science, for society, for our times – is (and must be) recognizing the centrality of subjectivity. Subjectivity means all that goes on individually, privately, and only partially consciously within each of us” (ibid. 47; emphases added). Bugental’s position is compatible with the positions of R. Laing and F. Capra (Capra 2002) about the genuine science of consciousness based on subjectivity and experience.

Bugental describes “presence”, which is revealed in a therapeutic alliance or in long-term helping relationships (ibid. part 2). Presence is “a name for the quality of being in a situation or relationship in which one intends, at a deep level, to participate as fully as she is able. Presence is expressed through mobilization of one’s sensitivity – both inner (to the subjective) and outer (to the situation and the other person(s) in it) and through bringing into action one’s capacity for response” (ibid. 27).

Bugental connects different reference frames to the phenomenological conception-and-experience of presence. He suggests two facets of presence – accessibility and expressiveness, locating the hidden owner of the crystal facets inside the personal and collective unconscious (ibid. 28–30). Accessibility is a reduction of the usual defenses and being influenced by others, growing one’s commitment in contact. Expressiveness is the extent of permission to be truly known by others. They are not either/or processes, but vary continually in relation to person and situation (ibid. 27). Bugental distinguishes the following “covers”, or levels of presence:

- Formal
- Contact maintenance
- Standard
- Critical occasions
- Intimacy
- Personal and Collective Unconscious (ibid. 28–29)

The dynamics of conversation through these levels – from formal surface to deep intimacy – are different in ordinary life and in psychotherapy. In addition,
Bugental describes the therapist’s own conversational levels using the same classification. To register them is obligatory, and to be aware of the so-called “interpersonal press” (ibid. 67). He investigates “how strongly the therapist attempts to influence what the patient will think, feel, say, or do as a result of the conversation” (ibid.). He suggests four “octaves”, which are depicting raising modes of press intensity: listening (first octave), guiding (second octave), instructing (third octave) and requiring (forth octave) (ibid. 69–89).

All these tools are directed to controlling the efficiency of multidimensional conversation dynamics. A professional helper can change the degree of subjective involvement, parallel with the conversation process, and the topic and the locus of attention (ibid. section III). These tools assist the helper to organize the partner’s merging in him/herself, and to make changes towards his/her main goal of conversation.

The depicted theory of change (Beisser ibid.), model and tools (Bugental ibid.) are intentionally centripetal and outline the “vertical” dimension in the self. The conceptual structure shows that human subjectivity has centering and deepening phenomenological dynamics, growing towards the hidden subjective center, “the I”. The main interest of modern Gestalt-therapy (Lebedeva & Ivanova 2004, 342) is to follow the dynamics of phenomenological reference frames inside and between selves in relationships. The same interest is central also in this study.

The partners of a conversation can widely regulate their actual presence and influence. The deepest level of presence in a conversation, by Bugental, is intimacy, a kind of peak experience. It manifests the maximum accessibility and/or expressiveness between the partners: “his sensing is maximal and his intuition is fully engaged. Instances of what may be considered extrasensory perception or telepathy may occur. …the mutuality of intimacy is one of its most distinguishing features” (Bugental ibid. 43). The revelation of basic mutuality (Bruner 1986) probably expresses the meeting between I and Thou by M. Buber (2000). It is also close to “the vision of more authentic being” (Bugental ibid.), when the cognitive functions are out of process (Buber ibid.).

Third, Perls (1969b) depicted the distinctive features of deepening into subjectivity in his training seminars. He described three zones of awareness: self-awareness, awareness of the world and between these two (ibid.). The zone between was often called the zone of fantasy, which was supposed to interrupt the contact with the world. This intermediate cognitive zone is investigated less than the others in spite of the intermediate position in the hierarchy, crucial for the subjective change. Two statements help to understand Perls’ interest in creative
peak experiences. The first claims that the function of the organism is to discover (Perls 1969c), and the second that learning is discovering of oneself based on self-awareness (Perls 1969b). He focuses on qualitative shift with blowing up by emotional energy, which reveals self-authenticity (ibid. Part 2).

Fourth, the Gestalt therapy has paid much attention to Husserl’s phenomenological reduction (or eidetic reduction) towards the deepest oneself (Lebedeva & Ivanova 2004, 77–85). This process is performed on methodical refusal from conventional knowledge in search of undoubted comprehension. The deepest self’s activity is the attentive and non-interpretative presence of the transcendental ego, or of apodictic view (E. Husserl, quoted by Depraz 1999; Varela 1999). The helper has a purely phenomenological view of the self’s dynamic process at any moment, but does not evaluate his/her behavior diagnostically. He uses the presence skills to be with the other self (Lebedeva & Ivanova ibid. Parlett 1991), growing from the very roots of awareness (Polster 1995), in order to keep a non-evaluating view from deep inside and to see the pure flow of the relationship process.

The phenomenon of self-center is depicted in the manifestations of motivational center, the controlling alternations of self-resistances and the environmental self-activities (Zinker 1994, 119), and in integration of the self towards genuineness (Perls 1969c).

Now it is possible to accept the depicted richness of the self-center’s manifestations and to identify the origin of the reference frame with authentic center of the self. Thereby, “the general of the army” guides authentic self-manifestations by a centralized reference frame.

The self-center, a complex-connected metasystem of the self is inseparable from the whole self-functioning, and it is a constituent and a guide of any self-activity. It shows features of belonging to a centralized subjective reference frame of the self. They are as follows:

- The central encompassing of all the polar self-manifestations – structures, experiences and activities, such as identification/alienation, widening/stretching of self-boundaries and resistance/assistance of the self.
- The centripetal, “vertical” increase of presence as the quality of being.
- Reduction of interruptions (resistances, defenses) as access to the inner center of the genuine being.
The centripetal dynamics of widening of awareness, growing of self-energy, creativity, genuineness and authenticity.

The centripetal growth of the intensity of the subjective experience.

Why organizing the awareness of self-experience and self-structure should happen before choice making, or before the conscious activity of the Ego-function (Lebedeva & Ivanova 2004), now becomes clearer. Awareness of the self-experience and of the structural self-identity opens access to a deeper center, “the I” (Perls), the point of origin of the Ego-function. Metaphorically, the research of the Id- and Personality-functions defines specific characteristics of the so-called conductivity and its change between the self-center and the environmental field. The aware Id and Personality are more conductive or transparent for the Ego-functioning between the self-center and the environment than unaware.

Consequently, the contact cycle could be seen as dynamic oscillations of the energy of the self that is consumed to change the self-boundary and its conductivity. The energy runs between the metasystem of the self and the environment for the sake of the actual need. The metasystem of the self, therefore, performs conductivity organization and restoration.

In the depicted energy-structure oscillations, the need hierarchy of the self turns to competence on intimate order originated in the metasystem of the self. This specification, in common with the relationship models of the Gestalt approach, manifests the whole self in the environment as an open dynamical system.

In the open system of the self, self-experience and self-structure are connected with the presence facets – accessibility and expressiveness. They manifest conductivity of the boundary, mediating human relationships. In communication with others, the self uncovers its deeper levels for the sake of self-development (Perls 1969b; Bugental 1987). Boundary conductivity and presence levels are regulated by awareness.

In order to understand the influence of the self-center on the whole self-activity we have to accept the metasystem of the self as a source of reorganization of the whole self-content and self-functioning, as well as the reorganization of self-boundaries and relationships. In addition, we can restate Enrights’ famous statement that awareness is a consciousness flow through that moment (Enright, 1980): awareness is a consciousness flow through the actual presence level at that moment.
2.3 Attention and awareness dynamics in relationships

Attention and awareness are two indivisible intertwined dynamic processes: it is possible to be aware inside the attention focus only. They constitute two functional processes with the same origin and directions. In consequence to the previous theoretical analyses, we suppose that they have the origin in the actual self-center, or in the motivational center (Zinker 1994), in the metasystem of the self. Therefore, it is possible to be aware of an intrinsic, middle zone (thoughts, imagination, etc.) and external phenomena including other people (Perls 1969c).

The self-center controls the direction of attention intertwined with awareness. K. Jaspers (1963) describes the phenomenology of attention as a clear consciousness domain inside a general state of consciousness (ibid.). Attention has three dynamical constituents.

The first – experiential constituent is the experiencing of intrinsic re-orientation towards something. Awareness of the re-orienting factors follows active re-orientation. In Gestalt, the first attention reorientation in contact happens in the fore-contact (Goodman) or sensation phase (Zinker). Attention is re-oriented to the figure spontaneously or deliberately. The awareness of the experience (the Id-function of the self) plays the main role.

The second constituent, attention degree, is a clarity degree of consciousness and content (Jaspers, ibid.). When attention is attracted to something deliberately, the self encounters something. Only then does attention connect the self with the attractor, starting the identification. There is no interpretative activity of the mind.

The third constituent is influence of attention on further flow of psychic life (Jaspers 1963). This constituent manifests at-tension, making exertion between the self and the attractor of attention. This constituent of attention connects the self to the content of attention and permits it to be involved in the attractor to a chosen extent.

The Personality-function of the self and the self-boundary are connected to the second and third constituents. They refer to attention concentration, often used in the Gestalt therapy. The third constituent has common elements with intention and awareness growth.

Zinker (1994) describes awareness metaphorically with an onion-like model as a “constant dynamic state”. It is a continuous, directed, penetrating and oscillatory phenomenon. It “organizes stimuli, comes into sharp focus (figure formation), builds into energy and action (contact), disperses itself (withdrawal), and then scans for the next set of stimuli” (ibid. 96). To exercise the skills of
being aware of urgent needs, these oscillations must be multiplied several times (ibid. 97–98). The awareness model, consisting of the metaphoric onions connected horizontally by roots and stalks (see Fig. 6 bottom), shows an order of accumulating self-richness and self-growth (ibid.).

![Fig. 6. Interactive cycle (above) and dynamic state of awareness (below) (Zinker, 1994).](image)

Focusing of the awareness oscillates along the horizontal axis as follows:

- Perceiving – starting from the narrow part on the left side;
- Enriching analytical base – filling the widest part of the left onion with layers of experiential order;
- Distilling thinking by narrowing the analytical base – the neck between the onions;
- Focusing and synthesizing – readiness for action at the narrow stalks (ibid.).

Zinker often gives a similar meaning for awareness and analytic work. This may point to undiscovered connections between cognitive functions and awareness. His description of awareness oscillation says, “expansion follows distillation in a rhythmic pattern of organizing experience, acting and so on” (ibid. 99; emphasis added). Rhythmic activity is possible only from the point of the origin of the oscillation reference frame, the self-center. Zinker calls awareness ready to act “distilled, lasered synthesis” (ibid. 98), using analogies of nonlinear optics of coherent ray radiation. These laser-like awareness pulsations in couple or family relationships could be extended to the awareness in relationships between the self and the environment.
In Zinker’s *interactive cycle*, the common system is emphasized. It was experientially discovered, that the common system dynamics of a couple, family or group in interactive contact concur with contact dynamics between the self-system and the environment. However, there are differences in awareness of these relationships.

### 2.3.1 Modes of attention and awareness

Awareness is a continuous and directed oscillation, the main independent variable in the relationship dynamics. Even if “awareness” is the second phase of the interactive cycle (Zinker 1994), it is particularly the awareness of a *figure*, convenient for the therapist to observe. Attention and awareness follow the self in any organized relationships – in the self-environment contact and in the interactive cycle. First, they follow the appearance of a figure inside the organism borders (sensation and awareness (Zinker 1977; 1994) or fore-contact phase (Perls et al. 1980). The main direction of awareness at that phase is awareness of the mostly *affective inside-self phenomena*. This mode of awareness follows the self along the whole relationship in activity. For the sake of convenience, let us denote it as awareness of the first mode (*A1*).

Awareness of thoughts, memories, interpretations, and imaginations helps us to create contact with the environment. Unaware mental processes distort or destroy the self-environment relationships. The awareness of the change of mental constituents; “enriching analytical base”, “distilling thinking” and “focusing and synthesizing” (Zinker 1994) is poorly known. Perls' negative attitude to “thinking about” often arouses a negative attitude to thought phenomena *in general*. It is necessary to develop the awareness of this blind spot into a real holistic Gestalt-concept. Therefore, we suggest denoting the awareness of thoughts, memories and fantasies – the middle zone phenomena between the self and the environment – as awareness of the second mode (*A2*) in the whole awareness dynamics. The first activity of A2 in the contact cycle appears in the research of the Personality-function of the self: self-structure (Lebedeva & Ivanova 2004) or self-conception (Ginger & Ginger, 1999).

We can denote awareness of subjects outside the organism boundaries, in the environment as the third mode (*A3*). It is most active at the energy-action (Zinker 1977; 1994) or contacting (Perls et al. 1980) phase, having a different extent later on. This mode of awareness traces the expansion of self-energy to the environment.
In a dialogic relationship of the interactive cycle, excitement energy grows with the awareness of the other, with understanding of his/her needs and intentions (Zinker, 1994). This awareness is rooted in the connection between people in a dialog. It is present in the interactive cycle, through all phases of the mutual contact. Therefore, we can name this interactive awareness, awareness of the other (A4). If the participants of a dialog elaborate it mutually, it creates a mutual awareness (MA), the most complex awareness in a relationship. It manifests multiple attention re-orientations between the self and the other, actualizing all the awareness modalities. This modality is strongly conditioned by the skills of the non-interpretive phenomenological seeing and hearing of the other, of presence and of giving feedback to the members of a common system. Only then, the energy of mutual awareness can create a common figure and support a common ground of relationship (Zinker, 1994).

For an inexperienced helper, there is a trap in mixing two different phenomena – the energy of self-expression with the energy of awareness of any modality. For instance, awareness of the other (A4 modality) transforms energy into mutual awareness energy, which is basis for creating a relationship. Active self-expression energy may appear without any self-awareness, and excludes any awareness. Conflict escalation, for instance, contains unaware self-expressions, and causes dangerous accumulation of destructive forces.

Self-awareness (A1), combined with awareness of the other (A4), gives better attunement to a partner. It entails a mutual awareness (MA) and a better support of partner (Zinker 1994; Wheeler 2000; Lebedeva & Ivanova 2004). Mutual awareness, in turn, results in the perception of unity, in the sense of coherence in the final contact phase (Perls et al. 1980) or in the contact and the resolution/completion phases (Zinker 1977; 1994). It could be related to the basic mutuality also (Bruner 1986). The rhythmical awareness of that kind in human-environment and man-man relationships has a different complexity. The experience of unity occupies the scale between the human-environment event descriptions (Perls et al. 1980; Csikszentmihalyi 1991; Ginger & Ginger 1999) and deep interpersonal relationship experiences (I-Thou (Buber 2000), I-You (Frank 1990), intimacy (Bugental 1987; Wheeler 2000)).

A middle modality (Ginger & Ginger 1999) at the final contact phase is followed by intertwined modes of awareness (A1, A2 and A3) and results in self-restructuring. Gestalt practitioners often call this phenomenon a healthy or aware confluence. It lasts a limited time, and is characterized by the authenticity of the self in relationships. It is accomplished in further withdrawal of awareness from
the environment inside the self-boundaries. In couple or group relationships in the contact and the resolution/completion phases, all modalities of awareness (A1-A4 and AM) are present and intertwined. We can refer to the complicated rhythmical awareness confluence as holistic awareness in general. A relationship in the complex awareness mode may only be multidimensional.

After this survey of awareness modes the contact boundary of the self, a couple or a group can be represented as multidimensional intersection of the common experience and competency of two or more systems, a complex event.

2.3.2 Awareness modes features

Mixing the others’ experience with one’s own or unaware confluence with the other means absence of the A1 and A4 modes of awareness. This entails unaware synchronization (entrainment or locking in nonlinear oscillators’ connectedness (Pikovsky et al. 2003, 30)) with the undifferentiated sources of experience, which are recognized as one’s own.

Developed self-awareness (A1) can identify the self with the transcendental Ego (Husserl), the metasystem of the self. Rhythmic alternations between A1 and A3 (awareness of the environment) show a flow state of consciousness (Csikszentmihalyi 1991). A well-developed awareness of the other (A4) in combination with a well-developed self-awareness (A1) may reach meeting, mutual identification/alienation of the partners’ self-centers. Developed awareness of thoughts (A2) separate from other awareness modalities and identifying the self-center with imagination may lead to a trance state in the humanistic hypnotherapy of M. Erickson.

Some of the ADHD and Hyperactivity Disorder cases match specific attention and awareness disorder cases. In the future, ADHD symptoms can be examined using the Gestalt approach focusing on the disorders of the self-functions and the relationship interruptions.

Self-awareness is an evolutionary, immutable source of direct knowledge on the psychosomatic self, the world and the others. Therefore, unaware self-domains (undeveloped A1) or mixed experiences (unclear A2 or/and A3) might be a source of interpretative errors about other person’s states and experiences (distorted A4).

It is important to emphasize that rooting awareness solely in the dynamic self-center and self-identity makes self-change possible. Attention directions are also constituents of the subject’s awareness. Therefore, awareness is a tool for working
with attention and, which manifests its continuum (Enright 1980; Lebedeva & Ivanova 2004). This awareness field is self-sufficient in the subjective change. Partial awareness leads to particular changes.

Field theory was used in the Gestalt therapy as a tool to describe motivational and relational dynamics. We need it in order to understand the awareness of relationship dynamics in the awareness continuum.

2.4 The field theory of relationships

Kurt Lewin made an effort to develop field theory in psychology in a strict scientific way. Connections between his theory and the nonlinear dynamical system approach should be studied in an additional research project. We believe that such a project would enhance our understanding about the dynamics of the psychological field and forces. We will review some elements of Lewin’s field theory and its applications.

Heckhausen (1991) analyzed the motivational aspects of the field theory. He states that Lewin’s view of the dynamic interactions takes into account “all of the behavior-relevant conditions of the present situation and internal states of the person”. Descriptions tend “to establish causal dynamic relationships between them” (ibid. 115), using even a formal mathematical expression of dynamic interactions. Heckhausen points out the differences between Lewin’s theory and other learning and behavioral theories. He lists six major characteristics of the dynamic and self-centralized field psychology:

1. The analyses of behavior reconstruct the entire situation as it exists for the person.
2. The explanatory approach is psychological. Determinants of behavior – environmental or within the person – are psychological, and not quasi-physical. It includes what is not consciously experienced but nevertheless influences behavior.
3. All behavior is driven by an underlying force, but not through stimulus-response connections and is not stimulated by general, nonspecific drive.
4. The constructive method, based on general explanatory concepts, serves as building blocks to explain the specific, concrete instance.
5. Behavior is a function of the present existing field. Past or future events cannot determine behavior because of their absence at this moment. They can be remembered or perceived respectively in the present, becoming effective
determinants of behavior. For instance, learning may have contributed to the present through peculiarities of the person and the environment.

6. It is necessary to present psychological situations in terms of mathematical models; in Lewin’s words, “to permit scientific derivations” and to use logically strict language connected to constructive methods. Mathematical representations can be qualitative (ibid.).

The first professional publication of Lewin – “Military Landscape” (Lewin 2001, 87–93) – is important for several reasons. First, it was a basis for Perls’ non-mathematical reflections on field phenomena (Perls 1969a). It helped to discover the significance of different positions of witness, connected to the self’s functional relationship to the current field. Second, changes of observers’ self-identity with the change of the witness position were explained inside a person’s own aware experiences. It gives concrete tools for the positional changes inside the self, for the location of intrinsic boundaries (and Lewin’s regions) and for introspective investigation. Third, the landscape metaphor mainly coincides with the depiction of phase space, belonging to the conceptual base of the nonlinear dynamical systems (Abraham 1990, 1995; Guastello 1995), and allows immediate use of nonlinear concepts, such as basins of attractors, saddle points and repellors (ibid.).

The next important phenomenon is a boundary, joint to the researcher. The researcher views the boundary with all inside-boundary phenomena as a witness, and experiences him/herself as a subject of the relationships appearing at the boundary.

In search of a strict scientific description of psychological laws using qualitative mathematical models, Lewin saw them as true wholes more than a sum of parts (Lewin 1935). A psychological law for him is a conditional-genetic type of process, or a combination of types (ibid.). These process types are qualitatively uniform, and each process law has phases of dynamic change. Therefore, the psychological law can be found in the research of a single case (ibid. 40–42). The relativity principle, considered above, is in agreement with this statement.

The qualitative psychological process allows focusing on specific features of behavior at any case. An individual case is conditioned by historical process. Ascending from a “here and now” case to a common type or law is possible at once (Lewin 2001, 49). The way to establish the law or to disprove it – is the experiment (ibid. 50). Dealing with the laws, researchers do not need statistical frequency of equal events, but deep analyses of single cases (ibid.). It is more
important to differentiate causal-genetic types of processes from random mixture of seemingly similar behavior, and investigators need a method for establishing process types (ibid. 51–52).

Lewin built up an epistemological basis for psychological law by examining significant differences between the Aristotelian and Galileian modes of scientific thought (Lewin 1935). He analyzed two ways of thought in physics and psychology in “A Dynamic Theory of Personality”. He understood the urgent need for dynamic concepts in psychology and realized that the Aristotelian mode of thought in psychology (ibid. 2–21) almost coincides with the statistical approach: abstract classification of events, randomness, case frequency as lawfulness, class of cases as essence, statistics as a basis for quantification of commonalities, common sense thinking limiting the knowledge, and opposition of common groups to an individual case (ibid.). In this approach, there is no possibility to define a process-oriented psychological law, impossible to approach the actual psyche and to understand an individual’s lawful behavior.

We quote the Galileian mode of thought with some abridgments and with our comments and additions. Lewin’s original statements are highlighted by italics.

The Galileian concept formation has the following basis:

- **Unification** (homogeneity) of Fields. **No Value Concepts. No Dichotomies.** Every psychological law must hold without exception (for instance, the perception of wholes belongs to all perception modes).
- Unconditional general validity of psychological laws: “Mounting Ambitions”. It is not easy to accept exceptions: “no exceptions in the entire realm of the psychic, whether of child or adult, whether it is normal or pathological psychology” (ibid. 24).
- **From the Average to the Pure Case.** It liberates psychological laws from special criteria, such as the frequency of occurrences. Historical rarity is not a disproof of the law and historical regularity is not a proof of the law (ibid. 21–26).

Based on the “Galileian theory of dynamics”, Lewin describes how to develop dynamic concepts in psychology (Lewin 1935, 29):

- Only by the concrete whole which comprises the object and the situation are the vectors which determine the dynamics of the event defined;
- Reference to the full concreteness of the particular situations;
The Meaning of the Process Differential: “the whole situation changes with the process”. Thus, both strength and direction change the vectors, which determine the dynamics at each moment (ibid. 28–33; emphases added).

The validity of a single case, or in other words, the validity of the whole situation dynamics supposes that the main characteristics of a psychological event are revealed: “The dynamics of perception is not to be understood by the abstract Aristotelian method of excluding all fortuitous situations, but …only by the establishment of definite structure in a definite sort of environment” (ibid. 40).

Lewin specifies self-functions as internal forces. They are valuable constituents of the psychological force field: “The dynamics of the process is always to be derived from the relation of the concrete individual to the concrete situation, and so far as internal forces are concerned, from the mutual relations of the various functional systems that make up the individual” (ibid. 41). This theoretical statement is a starting point for the improvement of the theory of the self in the Gestalt therapy.

The recommencement of interrupted actions (Lewin 1926; 2001, 130–132) is a logical sequel to his vision of the psychological forces. All interrupted actions, in Ovsyankina’s experiments with children solving dull tasks, were recommenced. Lewin paid attention to the strong tendency of action recommencement, to the steadiness of this tendency to renew the interrupted action, manifesting the intrinsic will forces (ibid.). He described the deliberate actions flux dynamics as a sequence of three phases: motivating process, choice making or intention, and intentional action (ibid. 125). In the flux which does not need any external stimulation, he stated a goal-directed intrinsic exertion, prompting the realization of individual intention (ibid. 137). Lewin’s student Bluma Zeigarnik studied action recommencement through the intrinsic exertion as such (ibid.), which became familiar as the “Zeigarnik effect”.

In “Kurt Lewin’s theory of personality” (2003, 231–309), Zeigarnik describes Lewin’s regulation of needs. She emphasized that intrinsic exertion is as common for true needs as for quasi-needs (ibid. 242–252) and reveals the intention. The quasi-needs are socially conditioned in Lewin’s sense. “For Lewin, social did not mean socially conditioned. Social merely meant that the need appeared at a given specific moment” (ibid. 243–244). The quasi-need is neither inborn nor biological but of social origin. Any need rushes to satisfaction through discharging a dynamic tension (ibid. 243). Therefore, a quasi-need or intention is a tension system which appears in a concrete situation and provides human activity and
strives for discharge (ibid. 244; emphases added). Lewin specifies the location of a tension system: “Whenever a psychological need exists, a system in a state of tension exists within the individual” (Lewin 1938/1968, 99).

Lewin’s sequence of phases in deliberate action does not contain experiential dimensions. He only mentions the influences of internal forces on action. Therefore, the location of the origin of the reference frame is unclear: outside the individual or inside: if inside, where is it located? This uncertainty is typical for descriptive psychological investigations, when the reference frame is normally outside the studied phenomenon. Sometimes, however, Lewin changed the location of the reference frame. Therefore, he approached the Gestalt therapy in view of the relationship and noticed that goal only enters awareness in the second phase (Lewin 1926; 2001, 137). He also found that intensity of intention is not decisive for its effectiveness in reaching a result (ibid. 151). Decisive is connection to the true needs, and making an energetically charged psychological system (ibid. 152).

These conclusions and registration of functions of an individual tension system are possible only from the subjective reference frame, or from the self-center.

Physical objects and present individuals participating or standing by, in an ongoing relationship – arrange the whole psychological field, if they are seen “as they affect the particular individual concerned” (Lewin 1935, 75). This is a precise definition of the reference frame of the actual psychological field, centered in the individual. Psychological forces, having an effect on the individual, are not metaphorical, but real in Lewin’s sense. The actual influence is the main criterion for the registration of the psychological force: “What is real is what has effects” (ibid. 19). Thus, examining children in play with cubes, Lewin notes that the meaning of a thing in the field is real, and it depends on the “momentary condition of the child involved” (Lewin 1936, 76) and on social factors.

Lewin called “The direct relationship between the momentary state of the individual and the structure of his psychological environment” “fundamentally important”. Solving a mental task or participating in pretend play creates an environmental region, “into or out of which the child may go” (ibid.). The self participates in the creation of the psychological forces “having effects” in his/her psychological field. The psychological force, consequently, is a basic concept of vector psychology, a cause of change (Lewin 1936, 218).
Main properties of the psychological field forces as vectors are:

- direction
- strength
- point of application (ibid.)

Strength and direction can be represented as vectors, if the origin of the vector and the point of application are given. It is remarkable that Lewin disregarded the reference point of the vector as a psychological force in the definition. It is not a mistake, if we accept the human being as a natural point of origin. However, if the vector is defined as starting from the point of application (valence, according to Lewin), it has no definite point for the witness inside the self. In this case, the specific subjective meaning and the psychological influence of the psychological forces becomes unclear. The researcher loses a precise psychological tool for a wide range of the self-activities inside the self-boundaries.

Lewin used up-to-date tools of topological mathematics in the description of a vector of the tensioned systems – intentions – direction. He did not think it necessary to specify any exact reference point of the vector in the study of regions. Therefore, he was interested in the psychological forces as manifestations of tensions between the regions at their common boundary, for instance, between an individual and the goal in the environment. Depicting a wide scale of environmental relationships and psychological forces, he saw the main source of tension and energy just on the boundaries of the regions. Therefore, Lewin expounded the forces in conflict, which causes the state of tension, and arrange a field of forces.

Valence, however, is a psychological force creating a field out of a conflict, and steers “the psychical processes, above all the motorium” (Lewin 1935, 51). He called the event with dominated attraction “positive valence”, and the opposite – “negative valence”. Dynamics in the field are described by means of locomotions – directed movements, change of position (Lewin 1936, 216). All locomotions can only be determined relatively (ibid. 114), they happen in a life space. This is another parallel with the relativity principle. It is reflected, for instance, in the definition of life space as of a totality of facts of a specific individual, which determines his behavior at a certain moment, and represents the totality of possible events. A part of the life space in the current psychological situation is region. Individuals in a relationship, as differentiated regions of a common life space, are connected by means of locomotions and communication. Communication is also relative: two regions are in communication if a change of
the state of one region changes the state of another. The degree of communication corresponds to the degree of dynamical dependence. Barriers – boundaries, resisting locomotion, can differ in degrees (ibid. 216–217).

Lewin developed the terminology of mathematical description of human life carefully in the dynamical field of the psychological forces. Mathematical models were needed for “the providing of a workable representation of a concrete psychological situation according to its individual characteristics and its associated functional properties, and of the concrete structure of the psychological person and its internal dynamic facts” (Lewin 1935, 41).

Mathematical topology (Lewin 1936; 1938) was too complex for creating a general psychological model. Lewin, however, developed two different but partially complementary explanatory models – the person model and the environment model. As Heckhausen noticed, the environment model “is closer to issues of motivation”, and the person model is close “to those of volition” (Heckhausen 1991, 116). In addition, the person operates “by energies and potentials in absolute magnitudes”, but the environment model, operating by forces, goal-oriented behavior and locomotion, “uses vector magnitudes” (ibid.).

We do not agree with Grishina (2000) that topological psychology was the most unhappy child of Lewin (ibid. 20). She refers to K. Back who states that topological psychology is forgotten only because mathematical topology in Lewin’s time was undeveloped (Back 1992). However, Back adds that modern topology, for example, in the catastrophe theory, proves the arguable productivity of Lewin’s theory in psychology. Thus, the question whether Lewin’s mathematical strictness and topological descriptions of the psychological field forces are a lost labor, is disputable.

These authors did not understand that Lewin elaborated the phenomenological dynamics of psychological forces. Nowadays, the study of Lewin’s field theory is obligatory for the professional Gestalt practitioners. M. Parlett has successfully adjusted Lewin’s field theory. He believes that the field theory is a necessary tool in the Gestalt approach:

“Field theory, I have intimated, provides a way of appreciating reality. As such, as an overall system of knowing, it can be said to be an “epistemology” …which is at odds with the general or prevalent epistemology of normal science, of present day academic and clinical psychology, and of many forms of psychotherapy other than Gestalt” (Parlett 1991, 75; emphases added).

Hidden Connections” and “The Web of Life” by F. Capra (1997; 2002) are examples of this. The view of helping relationships in the Gestalt approach has changed:

“Many of the assumptions and working beliefs intrinsic to Gestalt therapy, like holism and organismic self-regulation and present-centeredness, all of them woven together in the field theory outlook, are being independently discovered and the thinking of people like Lewin acknowledged for being ahead of their time. The Gestalt movement has an important part to play in the emerging new era” (Parlett 1991, 76).

The field theory plays an integrative role in the Gestalt therapy and “includes all the maps concerned with how the organism relates to the environment, and thus the needs cycle, organismic self regulation, and the contact boundary and its disturbances could all be depicted in field theory terms” (Parlett 1991, 68). He emphasizes that “field theory is not merely an abstraction”, but is the practical “basis for a way of perceiving and knowing and understanding” of relationships by Gestalt-practitioners (ibid.). Parlett built a bridge between the mathematical language of the field theory and the language of helping relationships. For instance, “looking at the total situation” (Lewin, cited by Parlett, ibid.) means seeing “organized, interconnected, interdependent, interactive nature of complex human phenomena” (ibid. 69).

Parlett mentioned also von Bertalanffy’s general system theory applied to the family therapy, but gave voice to Lewin’s field theory in helping relationships. In this study, notions of the field theory are prerequisites for the model of relationships based on the Nonlinear Dynamical Systems. Therefore, we cite some of Parlett’s methodological comments. He presented five principles:

1. **Organization.** The meaning of objects organizes a constellation of the specific field. Interdependent participants (objects, etc.) – the “structure” and “function” of the field (according to Lewin) create an event. Actions are coordinated rhythmically (ibid. 77) by a wider organization of an overall meaning. In experimenting and awareness, they manifest links and contexts hidden before: “The meaning of the small event is revealed as the wider context or total situation becomes clear” (ibid. 70).

2. **Contemporaneity.** Organized field shows “the constellation of influences in the present field which "explains" present behavior” (ibid. 71). No past events, no plans and fantasies about future have an influence on the current process. They are included in a “field at present time” through “the-past-as-
remembered-now or the future-as-anticipated-now” (ibid.). Concentrating on “what is” rather than “what was” or “what will be” gives a present actuality, named by Lewin as a “life space”, when contemporaneity is combined by aware and unaware actual connections. Lewin developed a model of contemporary circumstances of relationships in the form of “field at a given time” (Lewin 1951, 43–59). But a linear time variable does not describe such phenomena, because the current field of the psychological forces depends on the awareness of many simultaneous influences.

3. **Singularity.** Any “person-situation field is unique” and “each of several persons inevitably has a different perspective or vantage point. …As we have observed many times in groups, what stands out as interesting or relevant for different people is varied in the extreme, relating to their background, current need, pervading present concerns and long-term unfinished business. …Meanings will be individually constructed and conclusions drawn which are not identical” (ibid. 73). The singularity principle is in agreement with the individual reference frame, and it manifests individual meaning and sense; abstract generalizations have no actual reference frame. What is actual and important in particular are the “individual circumstances, the client’s level of self-support, degree of awareness, time available, nature of resistances, urgency of present need, and ways the person interrupts contact” (ibid.). *No reference frame is more real than another:* “The honouring of the singularity of each set of circumstances and each person requires” (ibid.). Parlett and Lewin prefer “outlook and method which covers the ‘exceptional’ as well as the ‘usual case’ ” (ibid. 74).

4. **Changing process.** Continuous changing of experience entails a field change, and they are never the same as before. To follow the change of events demands a developed awareness and a permanent adjustment to novelty. The helper’s skill of “timing” – *synchronizing* – makes a field configuration appropriate to the self’s actuality. “Field theory thinking is thus relativistic” (ibid. emphasis added) and *nonlinear*: timing by proper weak influences is a mode of control a nonlinear dynamical system. The continuous field is always in flux, and reality perceptions are in continuous recreation. They re-establish “the stability and equilibrium of the field moment by moment” so that “there are obviously no absolute cut-off points” (ibid.). This coincides with Watts’ experience of perception as an infinite field of relationships (Watts 1969). Observing the organism-field relationship flux and registering
the forms of flux interruptions perform the gestalt diagnostics. This thought coincides with the research strategy of the nonlinear dynamical systems.

5. Possible relevance. Parlett describes a field as a nature-oriented participating consciousness, broken by 500 years of growth of science and industry. Now it comes back as an alternative unified field, “in which there is no hard and fast division between observer and what is observed, subject and object” (Parlett ibid. 76). Everything in the field is part of the total organization and is potentially meaningful.

Parlett’s activity in field is strictly divided from the clinical “field behavior” of being influenced by everything present; “the field is organized and what is most relevant or pressing is readily discoverable in the present” (ibid. 75). The origin of the reference frame belongs to the carrier of awareness, and awareness of the field influences allows deciding, what is relevant and what is not (ibid.).

The range of possible relevance expands beyond individual boundaries. In the case of two or more participants in the field, the observer’s attention to potentially active field is necessary: s/he should “be open to the present configuration of the field, whether anticipated or not” (ibid.). We can add that singular individual-field relationships, in combination with the second principle, i.e. contemporaneity, uncover the necessity of many connected individual reference frames (life spaces) in a current field of common life space. Any presence can have influence.

Looking at the definitions of the self with the field in context, Parlett defines the “self as being that which constellation the field” (Parlett 1991, 77).

In such a high responsibility of the self, Parlett asks, “How do I frame my reality at a particular moment? How do I arrange my “life space”? How do I organise my experience?” And answers: “I do these by constellating or organising (or configuring) the field according to particular meanings, a personal process in which certain parts of my total experience become figural and other parts are organised around them, as ground. And this process can be construed as the self at work or, in Latner’s phrase, “us-in-process”. The self is therefore (as in all Gestalt theories of the self) definitely a process and not a static abstract mental entity; it provides a way of describing an ongoing, evolving and transforming process in which we continuously engage, configuring the experiential field, or choosing our reality” (ibid. 77–78; emphasis added).

A widely cited theoretical description shows the origins of the field organization inside the self-boundaries. Parlett regards that the self organizes him/herself and the life space owing to actual meanings, rehabilitating the sense
and meaning making of the Ego-function. But neither Parlett nor Wheeler (2000) did show how this organization is possible. In spite of its centrality in the field theory, the concept of field is still metaphorical (Parlett 1997, 19).

The use of holistic categories metaphorically “as a concept and a mode of experiencing” (Parlett 1997, 17) does not remedy the atomistic or positivistic heritage. Acquiring “the “Gestaltist mentality” returns us to an “original, undistorted, natural approach to life” (ibid.). The attractive simplicity of homeostasis, cherished by Perls, Hefferline and Goodman (1980), and cited by Parlett, from our viewpoint, is a kind of habitual myth of the classic Gestalt therapy. Unfortunately, it misleads many theoreticians, pointing to homeostatic thought in spite of the qualitative dynamics of the steady state alternations in the complex human-environment systems. These are not studied sufficiently.

The flow of incomplete Gestalts gives a partial view of the holistic human life. A meaningful whole is not presented even in the field theory. Originating the existential meeting inside the homeostasis, it is problematic to arrange an integrated theory of the Gestalt approach.

The existential dialog aiming at sense-making goes beyond homeostasis. Buber’s meeting is initiated by the deepest intention of consciousness to be with the other in spite of the homeostatic outcome, irreversibly changing the previous equilibrium. Contemporary scientific, cultural, social, psychological and spiritual transformations overcome the homeostasis and go on despite of it.

The field and the self contain structure-keeping and structure-changing forces, which penetrate each other. From Gordon Wheeler’s viewpoint, self-change and development happen in a change-supportive environmental field, involving a professional helper.

2.5 The experiential field of human relationships

G. Wheeler discusses the problem of supportive field. In the introduction to “Beyond individualism” (2000), he poses a problem of discovering the self, and steps aside from the individualistic paradigm in relationships. He assumes that the self is located in the creative adjustment process on the contact boundary. Wheeler sees the self based on a social field not in Lewin’s sense, but as a collective field embracing the selves in any relationship activity. Support, in opposition to shame, is a key process of the dynamic field and the main self-experience. It is necessary to analyze the field conditions of support and shame,
and to build a bridge between inter-psychological and intra-psychological (ibid.). He also proposes the process model of the self.

The individualistic orientations, as proposed by Wheeler, can be summarized:

1. The individual is the virgin in comparison with relationships, and all important sides of the being are beyond the bounds of relationships.
2. Relationships are secondary and less real than the individual.

It is astonishing, that the most negative result of individualism directs the attention inside the individual in the search for a sense of life. Another argument is the impossibility of proper understanding of the other. Substituting individualism by atomism, Wheeler, unfortunately, throws away individual deepness and the existential-ontological life dimension. Criticizing individualism, accepting “being with the other” and experiencing the other, he loses the deep sense of coherence (ibid.).

As an alternative to individualism, he suggests a post-individualistic – constructivist – paradigm of the intersubjective order. Viewing the relationships as opposed to the individual, any constructed knowledge about the “field” is linear and unbalanced between the individual and the community. Wheeler elaborates his own vision of the field organization and chaos theories. The main points are:

A) A human being encounters the world as already structurally organized and distinctly packed into objects, events, models, and successions. It makes relationships with the world familiar and easy.
B) The perceptive act and task-solving process are not different. Reality restricts interpretations, but we design our own reality when we interpret it.
C) The self organizes his/her available experiences through creating the sense. The self is an actual creative force, constructing meaningful viewpoints.
D) Awareness is one with imagination and thinking. Thus, we are really living in the future. Cognition works for the future.
E) Reality is the structure of selective interaction in and with the field. Needs and urgent tasks organize the field of interactions. The subjective construction of the reality is a current map of the field, coordinating our needs-oriented activity.
F) Thus, the self is an affective self, forced to act by field forces. Effect is the evaluation of the efficiency of cognitive activities, directed towards fulfilling values.
G) Any knowledge is pragmatic, conditional, and hypothetic. The self is experimenter constantly changing knowledge, a creative designer of the reality, a creator of senses (ibid. Chapters 1& 2).

Wheeler is on the verge of losing individuality and responsibility for self-perceptions and actions: it is not clear – whose perceptions or actions they are. His view runs the risk of mixing awareness with imagination or interpretation. The equality of cognitive construction of reality to reality itself leaves an imprint on the whole of Wheeler’s position. The self depends on the field force influences, but the field does not depend on the self. Responsibility for the self-being turns to responsibility for the constructed discursive reality and living for the constructivist future. In the discursive world with collectivistic inclination, it is not clear who is actually the creator – the self or the field forces. Moreover, the self-awareness is descending: everything is clear from the awareness of the field forces or from the awareness of an imaginative creation of the future reality.

However, the clients and the helper are sharing their actual individual experiences about relationships in the exercises given in the Wheeler’s book. Maybe therefore, contradicting to himself, author sees the self as the one who integrates the field experiences, which are manifested in the integration process and in the dynamical rhythm of integration (ibid.). But he misses Lewin’s self-centralized psychological force field, when he tries to avoid mechanistic placing the self inside the self as a Cartesian spark of the soul.

He replaces the totality of the whole Reality by a cognitive domain – a layer – of dialogically constructed virtual reality of a few dimensions. The self in the intersubjective reference frame localizes on the border, on a place of adjoining “my” experience with those that are “not mine” (ibid.). The selves are mutually penetrative in any direction and thus they are intersubjective processes. His constructivist reality is a discursive dialog which consists of mutually compelled sub-processes of observation, perception, interpretation, prediction and affective evaluation, action and planning (ibid.). However, there is no space for those who participate in a discourse in this intersubjective virtual dimension.

A dynamic picture of Wheeler’s relationship, however, resembles autopoietic structures (Maturana & Varela 1973). An autopoietic structure is “a machine organized (defined as unity) a network of processes of production (transformation and destruction) of components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and (ii) constitute it (the machine) as a concrete
unity in space in which they (the components) exist by specifying the topological domain of its realization as such a network” (ibid. 78).

The dialogic-discursive field between the selves is similar to “the space defined by an autopoietic system”, which “is self-contained and cannot be described by using dimensions that define another space” (ibid. 89). The autopoietic space is natural in the interactive cycle in general, including discourse as a particular case of relationships. But the interactive cycle involves much more (Zinker 1994).

A combination of the constructivist and nonlinear view creates a dyadic protosystem (Wheeler ibid.), which is common for Wheeler and Fogel. It emerges in the discourse and keeps individuals in the shade. A feeling of integration after the orientation to the other “as if” to myself (ibid. chapter 4) shows weak individual meaning. There is no knowledge about the enigmatic self, who is able to orient to the other.

Referring to D. Stern (1985), Wheeler (2001) sketches the evolutionary task of a human being exercising flexible adjustment to the other and to the dynamical environment. Adaptation of the self, registering differences between the organism and the environment, however, are not creative. Wheeler did not go further than a classic Gestalt view of the self as a creative adjustment process itself, appearing in contact (Latner 1972; Perls 1973; Ginger & Ginger 1999).

Wheeler’s idea of the supportive field is directed to support the inner resources of the self by the attention and acceptance of the external field participant. It organizes the external resonance (Wheeler 2001), however, without any interest in the individual’s inner resources. A change is therefore based on the support conditions and mobilization of the self-support by organizing the external field.

Wheeler’s view of supportive relationships helps to compare the methodologies of the post-modernistic and nonlinear dynamical systems. The nonlinear dynamical system develops with one or several control parameters (independent variable(s)) and many dependent variables and events in the system. Wheeler’s mutual support does not show a clear control parameter of the relationship. Therefore, an aware relationship organization is problematic. He tries to construct the linear connections between supportive elements and mixes awareness with imagination. This reductionist view makes him to alternate constantly between absent self-sufficiency and self-experiencing of intimacy. However, his “external resonance” shows intuition of the nonlinear dynamical process.
In the General Systems Theory and the nonlinear dynamical systems approaches, there are steady nonlinear processes alternating with the unstable ones. The unstable process initiates the spectrum of irreversible qualitative changes resulting in a steady state of the system. The environmental field and dynamical system are related with one another through a controllable change of the control parameter (independent variable). According to the nonlinear view, the steady state of the system is a kind of support itself. But it does not follow from verbal theoretical conceptions developed by Wheeler. He rejects the phenomenological basis of Lewin’s field theory, and as a result also Parlett’s principles of field theory are hard to use. For instance, the principles of singularity and possible relevance (Parlett 1991) are not taken into account. Moreover, there is a risk that this theory becomes “words about words” in the discursive-cognitive sense.

Wheeler’s anti-individualistic approach, however, is an important argumentation against Perls’s understanding of the self as totally independent of other persons. It suggests a particular – discursive – mode of overcoming the rigid boundaries of atomistic isolation. A theoretical orientation to the future, to values, and to meaning making is of common theoretical and practical interest in modern Gestalt. Wheeler offers discourse-oriented solutions.

A. Watts (1969) offers an opposite view of connections between the individual and the social. His research on the social interaction in psychotherapy is almost 40 years old, but it remains modern. Watts describes the field of social interaction as a mode of social stipulation. He presented an opposite methodological view long before Wheeler. Wheeler deals with the same type of relationships as Watts, but in a contradictory context.

Watts (1969) starts his critical analysis of psychotherapy from the very basics. He defines experience as the first phenomenon of psychological life. Watts starts from the sensation of substance. In contact, we perceive the world as an integrated whole: a far away galaxy is recognized as star and steel – as an entire impenetrable piece of substance. This is why the very idea of matter reflects merely the limit of the imperfection of our senses and tools (Watts, ibid.). Accordingly, a clear recognized single element of system could be mistaken for freestanding.

The continuity of the universe, the totality of its substance and ties are still beyond the psychological and psychiatric methodologies. According to Watts, human change-making practices (education, psychology, psychotherapy) are in a great theoretical confusion. Most of the muddle, says the author, is derived from
concepts of the unconscious and perception, based on *old socio-methodological agreements*. The classic psychoanalytic concepts are an example of that mess. In reality, there is no opposition between “human order” and “natural chaos” (ibid. Chapter 2). In human investigation of nature we discover and learn special cases of universal order. At the current stage we grasp the world using the *system of language and thought*. Moreover, grammatical or mathematical cognitive needs can be mistaken for a necessity of nature as a *tool* (ibid.). Therefore, everything a human being describes scientifically is a description of empirical, experimental activity, or what man does using these tools, when he investigates the world. *Superficial gaze divides man from the world* (ibid.).

Watts thinks that the organism-environment system is a unified model of relationships and behavior. The crucial feature of that model is *not* the interaction of previously separated objects. A relationship is a *mutual penetration of the organism and the environment, given before any mutual recognition, and before any cognitive-linguistic denotation* (ibid.). It is *similar to a physical field* (compare with Lewin (1938/1968, 97), “psychological force is … certainly as real as a physical force”). Therefore, human behavior (perception, cognition, speech, action) is a coordination of the organism and the environment of the same nature as a meal.

Watts argues that the perceived “natural order” is the *only* possible order. Contacting, the sensation is the actualizing of a living net of our nervous system together with the cognitive – linguistic or mathematical – net of denotations. However, there are extra experiences, which cannot be depicted as the cognitive net, but they have effect and remain unaware. The difficulty in understanding the process is cognitive owing to the conservatism of language. We agree with Watts that it is necessary to describe a human being as an *active over-linguistic system*, coordinated with the world. Watts comes closer to Lewin when he says that man as a *process, described mathematically*, saves psychology from notions of the detached man connected to the environment (Watts 1969).

Gödel’s Theorem of Incompleteness (“the closed language system is incomplete”) describes this situation using mathematical logic language. Watts describes his own experience of liberation from old discrete concepts of the self as a process connected to a strong feeling of love and indescribable harmony. Exceeding the bounds of language and old agreements about human nature is not a pure theory: *experiencing the world as a field* is as clear, as experiencing the “I”, detached from observing phenomena like our thoughts, or stars which we see detached from the sky and other stars (Watts 1969).
Shift in perception happens, when life is no longer seen linearly and linguistically, and not as a fighting field for oppositions. Life becomes a polarized field for play of oppositions, in agreement with Einstein’s model of the unified universe, constantly transforming between matter and field. Man is an inseparable constituent of the world. That kind of perception is a perception above ego. Watts’s “ego” is not the Ego-function, or metasystem of the self in Gestalt. It is a projection of the socially conditioned self-concept (ibid.). Watts ascends above projections and offers a theoretical solution to Wheeler’s problematic use of the “projection” concept (resistance, or defense in pathological use). Perceiving a field itself, but not perception as cognitive projection of the self-conception to a field, gives birth to contact experiences (Watts 1969), and allows recognition of the other in the same field. This perceiving of the field offers a possible proof for Bruner’s claim of a basic mutuality.

The comparison between Wheeler’s and Watts’s positions shows an opposite view of relationships and of world perception. Wheeler’s socially conditioned self searches for support and avoids shame, and therefore needs to construct cognitive virtual reality, as a result of the detachment from the reality itself. He projects the self-conceptions to the world and others, makes cognitive agreements with others, and thus forms an illusion of self-support.

Wheeler’s relationships depend on cognitive appetites, on conceptions about relationships, but not on awareness of relationships. Therefore, they detach the self from the relationship experience, making them unstable. His view is opposite to Watts’ socially unconditioned relationships of the self, with strong ties between him/her and the world full of love. Wheeler is also contrary to sociality in Lewin’s sense.

Watts does not need to construct the support anew: he reveals it without constructions. In the dynamics of perception in human-aided evolutionary play, Watts becomes aware of the negative intrinsic distinction – between “I” and “my vision”. Revealing the deep connectedness between “I” and “my vision” shows perception as an infinite field of relations (Watts 1969).

What kind of perception permitted Watts to see the unity between the seer and the seen, between the actor and the activity? Where is the reference frame of the self at the moment of awareness?

Watts did not answer these questions. He repeatedly used double bind examples, which is usual in modern psychology, “you should be aware of unity between actor and action (it is proved by science), and you should not be aware of that coherence; otherwise a difference between self and world as we cognitively
suppose will be lost”. However, as for the extreme methodological question “is the Universe friendly?” Einstein answered positively. Therefore, awareness of the hidden connections (Capra 1996; 2002), influence of the “continuum of awareness” (Enright, 1980; Lebedeva & Ivanova, 2004) on current situation will change the quality of life.

Who is connected with the world and who is not a mere self-concept? What kind of “the I”, the self-center or metasystem of self transcends the self-boundary in friendly connectedness? Who is the witness able to claim all these experiences and keep them integrated?

Unfortunately, Watts did not answer these questions. Therefore, the last part of his methodological investigation gives an impression of mixing the subject, the ego and the aware witness inside one undifferentiated illusory ego. Living in the present replaces integration without a specific integrative center, and thus, it looks like re-establishing the lost homeostasis and biological spontaneity of the organism. Watts uses theoretical constructions about the probable change. He moves from experiential knowledge of the self-center to a theoretical critiques of psychotherapy, and leaves the questions unanswered.

2.6 The ontological relationships

In his research “I and Thou”, Martin Buber (2000) postulates that mutuality and presence are the roots of relationships. I-Thou, the first primary word, denotes the deepest experience of relationships in the present, occupying the whole of the actual being of participants. This is the ontological meeting, which manifests the actual pre-experiential totality of I-Thou co-being. The totality of the ontological I-and-Thou has no distance between Thou and I. These relationships are established before they become manifest in society. Revealed full mutuality – the essence of relationships – involves the I’s choice of Thou, as the other’s choice at the same moment, so that “all the real living is meeting” (Buber 2000).

In the “I - It” opposition of another primary word, the self is isolated from another and from the world. It is a time to use measures – to compare and to evaluate one another. There is no possibility of meeting at all. The rhythmical alternation of I-thou and I-It is the reciprocal event. The poetic vers libre of ontological relationships has two main aspects. The first aspect is the spiritual being inside “I-Thou” without proclaiming, without manifesting, just co-being. The second aspect is spiritualization, “spiritual inflammation” (ibid.). None of these aspects could be denoted unambiguously, but they manifest the deep
subjective experiential space. The words “specific structure of a dialog” facing Buber’s “I and Thou” are, therefore, inaccurate: all of his dialogic ontology slips off definitions.

Buber’s utterances on meeting experiences were answered in Frank’s classic ontological work “Inconceivable” (Nepostizhimoye) (Frank 1990). He consistently derives the fundamentals of the relationship between the self and the other from the single self-being. The immediate self-being is the genuine reality. It is not a pure psychological functioning as a subject of cognitive activity or results of reflection of the objective world. The immediate self-being is a revelation of the ontological reality itself, of the reality as such.

Particular psychological realities and functions, connected to the so-called objective world, are often described from cognitive positions. In this case, “subjective” means “imaginary” in the sense of “illusive”. However, it is a mistake, says Frank: our subjectivity is not imaginary-illusive or false. What can be false are our opinions or comments on the reality, statements about the reality in opinions. However, immediate experience based on those opinions or comments contain the seed of truth (Frank 1990, 340–341; emphasis added).

The immediate self-being is a being in the form of tendency to be; this is the true subjectivity as the immediate self-being. Subjectivity is an ontological intention, a dynamic tendency to be, and a kind of immediate self-being before being unfolds into external self-being (ibid.).

Frank’s definition of subjectivity is different from that of Bugental. The last is rooted in the collective unconscious of K. Jung. Subjectivity is a wide reality, a source of self-consciousness, and an endless universe in itself, which cannot be realized inside it. An essential feature of the immediate self-being, thereby, is transcending outside itself, crossing the borders of its own area of being.

Frank claims that the first tendency to transcend is a comprehensive intention, “ideal” directivity of “gaze” towards the reality, which becomes our ideal “property”. But it is not the main tendency; it is only a manifestation of the efficiency of immediate self-being. Immediate self-being stands “behind” something given, “meeting” something in a form not allowing any further analyses. Any “content” given in that way “reveals itself”, “clears up itself”, “is cognized”. But the initial moment of self-intending (Frank) through the infinite field of relationships (Watts) is again not the whole of the transcending of the immediate self-being, but just a pure ray of “light” reaching the object it meets. One should “feel” the object, “like” it, be “interested” in it, even in the negative forms of avoidance or rejection. Only then do objects become “sufficient”,

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“important” for us, get “significance”, affirm the practical sense of “actuality” – of what really acts on us (ibid. 343–344). All those processes exclude any cognitive interpretation.

The mode and function of description of the immediate self-being which Frank provides is similar to the psychic being given by Aurobindo Ghosh and Mirra Alfassa (“The Psychic Being”, 1990). These authors carefully differentiate between the nature, functions, influence and actions of the psychic being, on the one hand, and the emotional, mental and other psychosomatic manifestations of the human being, on the other hand. They even describe mutual influences between the psychic being and the frontal self: “What is meant … by the psychic is the soul element in nature, the pure psyche or divine nucleus which stands behind the mind, life and body (it is not the ego) but of which we are only dimly aware… It can then come entirely forward, breaking through the mental, vital and physical screen” (ibid. 4).

Frank tries to develop further Husserl’s one-way process of the phenomenological reduction, or epoche (suspension of inquiry) – from the world towards the self-being. A dynamical element of the immediate self-being is a two-sided tendency: the actual emotional-volitional intention oscillates between the immediate self-being in the world (being-in-world, being-with-world), and withdrawal from the world (back to the immediate self-being) (ibid.).

However, man does not always feel good in a being-in-world activity charged with emotional-volitional intention. He feels, says Frank, inner loneliness, withdraws and suffers from the contradiction. He feels contradiction between the intrinsic claims towards the boundless (unlimited) fullness of himself and the actual limitation and foreignness to all diverse from himself (ibid. 346). A genuine connection of the immediate self-being exceeding the authentic reality and transcending the emotional-volitional intention oriented to the world is not enough. Reality, essentially akin to the immediate self-being is needed.

Frank offers more than the transcendent ego’s activity (Husserl), and more than existential questioning about meaning inside the being-in-world. Actual transcending of the immediate self-being goes in two directions:

Transcending outside – transcending into another Self, another “Am”, another self-being, akin in a kin of being, but “other”. This is the “I-You” transcending inside a relationship.

Transcending inside – transcending into an intrinsically self-evident actual being, actual base of the immediate self-being. This is transcending into “pure objectivity”, into the reality of spirit (Frank 1990, 346).
My research topic is close to the outside transcending in the “I-You” relationship. However, transcending inside is interesting in the context of the existential anxiety of Sartre, who does not recognize the immediate self-being in Frank’s sense. In spite of breaking further into inside, Sartre replaces the immediate self-being with Nothing. His philosophy, therefore, misleads psychologists in searching theoretical connections between self-responsibility and self-integration: the Nothing cannot integrate or be responsible.

In the description of transcending outside, Frank uses small letters (“i” & “you”)¹. In English, capital “I” reflects some primordial nature of the self. Therefore, we use the concepts of “I” and “You” to describe the meeting of the immediate self-beings. It also agrees with Buber’s ontological concept of “I and Thou”.

Frank criticizes the superficial positivistic perception of the psychic phenomena without recognizing their “carrier”. He reveals that the fact of some other soul, of some other consciousness “is given me as being before”. Even if some features of the other can be clear at that moment, in common the other is inconceivable.

Frank thinks that identification with the other and recognition of the other is the deep akinness of the other. The other lets me know him touching upon me, permeating inside myself, initiating my deep living reply. The actual “I-You” contact precedes cognition because of the I-to-You revelation (otkrovenije – according to Frank)². The revelation is a revelation-to-other, revealing myself, presenting myself to the other before expression, and before any evaluation possibilities. It is defined in two aspects:

- Revelation as active self-disclosure from inside the ontological reality, directed from You to Me immediately.
- Revelation of reality as such, as Inconceivable, but not the revelation of the content of reality (ibid. 353–354).

The experience of the dynamic emanation from inside “I” coincides with the experience of entering into the “I” by the existentially connected “I-like”³. This is

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¹ In Russian small letters of i & you means mutual equality, but different from equality to The Highest, to God
² In Russian - has the meaning of disclosure of one’s deepest being to other
³ Sufficient, that “I-like” outside of “I” is “other I”, by Frank, totally different from psychological another Ego, or Alter-Ego – I.S.
the central point of the ontological ‘I’ birth. The ontological ‘I’ can only be born with the ontological ‘You’. ‘I’ and ‘You’ are born from inside a process similar to the “mutual, joint blood circulation”: I go in indivisible non-confluence with You, where I-ness is akin to You-ness (ibid. 356).

The mutual penetration of I and You, their deep kinship and mutual comprehension is ontologically fundamental (ibid. 368–373). If there is no “I” without “You”, then it also manifests the fundamental transcendental all-unity of the individual souls. This common living being (ibid.) is hidden from the being-in-world, and represents the transcendental interconnected polycentric system (ibid. 358). It is manifested through “being Us” – a trans-rational (rational and over-rational) unity of common order and common goal of life (ibid. 384).

A brief survey of the ontology of relationship shows a difference between the holistic and ontological views. In the holistic approach, the analogical thinking and cognitive faculties are enough. The ontological comprehension of relationships demands the researcher’s identification with the immediate self-being, aware self-transcending and deep presence with the other, the acceptance of basic ontological mutuality between human beings.

### 2.7 Research problems

The main problem of this research is formulated as follows: how is a nonlinear phenomenological model of human relationships possible? As the review of theoretical research shows some elements of a nonlinear model can be found in earlier linear modelling of human behavior and relationships. But these elements cannot be integrated into a comprehensive model without a multidisciplinary approach to modelling. Methodological ideas are combined from several disciplines e.g. epistemology, general systems approach, synergetic, Gestalt therapy, psychology, social work etc. These kinds of research and research problems have a theoretical nature and the main result is a hypothetical new model of human relationships. The main problem is divided into the following sub-problems:

1. How is it possible to integrate previous linear relationship models and Vygotsky’s model of the ZPD with the phenomenological models of relationship (A. Fogel, J. Zinker, etc.)?
2. Which qualitative nonlinear features of professionally organized relationships can be taken into account in generalized nonlinear dynamic model of relationships?

3. What kind of methodology is needed for the phenomenological nonlinear dynamic model of relationships based on Gestalt-approach?

4. What kind of empirical material is appropriate to demonstrate qualitative features of developing nonlinear model?

We suppose that the theoretical research of relationship models will prove, that phenomenological nonlinear dynamic models of human-environment and man-man relationships reveal new qualitative characteristics, which are not visible in earlier linear models of relationships. Nonlinear dynamic models offer better tools for professional analysis and use of relationships in education, therapy and the social sector.

Summary

One important factor lacking in the theory of the Gestalt therapy is reference frame; which center is situated in the self. This kind of system is absolutely necessary for a better understanding of the field theory of K. Lewin. According to Lewin any activity has the reference frame in the self as the source of individual psychological field forces (of the tension system).

The awareness flows through self-centered reference frame. The reference frame represents a relative, individual knowledge (in R. Dilts sense) and originates the tension system of the self, elaborated by K. Lewin and B. Zeigarnik. The validity of generalization based on a single case is based on the “Galileian mode of scientific thought” and the scientific understanding of laws of psychological change. It is also based on authentic phenomenological knowledge related to a specific reference point.

Oscillations of the reference frame, its ability to identify and alienate explains many features of relationships. A subjective space-time event of relationships has its own time scale kairos, because of self-centered reference frame. The theory of paradoxical change, developed by A. Beisser finds a clear explanation. A paradoxical change is the shift of actual self-conception (personality-function of the self) towards self-centered reference frame, resulting in self-awareness i.e. discovery of actual self-coincidence and self-accordance.
The quality of being described as presence by Bugental, Parlett and Zinker can be understood as connectedness of partners’ reference frames. This throws light upon Buber’s meeting and Bruner’s basic mutuality. Ties between reference frames of different selves are most probably not grounded on Wheeler’s cognitive virtual constructions.

In order to understand the basic mutuality and phenomenological relative knowledge, a phenomenological notion of the psychological field of force in human relationships is needed. Kurt Lewins’ dynamic psychology and the field of psychological forces concept are briefly described. Parlett’s verbal explication of Lewin’s field theory is helpful, but not enough. The awareness modes in interactive contact show that the psychological field in relationships is subordinated to each participant’s attention and awareness. The awareness is originated in the self-center of each participant. Therefore, the psychological field in human relationships may be described merely by showing different partner’s phenomenological reference frames coordination.

The connection between reference frames is not just cognitive. It is based on the Lewinian self-functions as internal forces. This explains why the reconciliation of interrupted actions and even interactions is possible. The deep connectedness of basic mutuality seems to be grounded on the field of present psychological forces between human beings, similar to relatedness depicted by A. Watts, M. Buber and S. Frank. This offers a possible interpretation of the concept of basic mutuality as a reality, essentially akin to the metasystem of the self (to self-center), or to the immediate self-being. The present connectedness of immediate self-beings of each human being represents the interconnected polycentric system. It is not on the surface of relationships, but in the transcendental connectedness of self-centered phenomenological reference frames. In order to reveal the phenomenology of connections between different self-centers – I-You relationship – additional research has to be carried out. To construct a deep I-You connectedness, coordination skills of presence levels and different awareness modes organization have to be exercised.

The analyses of previous models of human relationships showed that they have in many cases nonlinear dynamic constituents in spite of a general linear form of models. The separate relevant constituents are picked up and the main problem of synthesizing research is formulated – how a nonlinear phenomenological model of human relationships is possible?
3 The nonlinear dynamical modelling of relationships

3.1 Appearance and necessity of the nonlinear dynamical systems

The history of social psychology after Kurt Lewin is relatively short, as well as the helping relationships practice after Alfred Adler, Karl Jung, Karl Rogers and Frederick Perls. But the amount of research into human relationships and change is enormous. Different theoretical concepts and applications often have no common contexts, although the same quantitative research methods are used. We use philosophical and methodological ideas of modern fundamental sciences to diminish this problem.

Conceptions of relationships represent cognitive and basically linear thinking regardless of their background (cybernetic, systemic or holistic). A linear relationship is:

- a successive chain of phases, steps and/or principles;
- a sum of structure and functions;
- a process of gradual and basically predictable changes;
- a composite unit arranged by independent participants.

It is often implied that, participants of a relationship:

- Make proportional or disproportional efforts to effect changes in the relationships.
- Come into contact rationally; reply emotionally and with behavioral manifestations.
- Establish contact using a perception-action system, acting as coding-decoding stimulus of several modalities.

The theoretical design of a relationship implies one event or object, having one consequence or result in one period. It is based, thereby, on causal logic, even in the circular causality of the systemic family therapy. There is a linear dependence of variables, thus modelling is possible by a straight line in the Cartesian coordinate system. In the mathematical form, the models are linear models of relationships. These models are convenient for simplified descriptions of complex relationships. However, they do not describe the important nonlinear and unpredictable character of relations and subjective change. In the linear approach, most of the observed nonlinearity is:
– not aware, and if described, nonlinearity is interpreted as an annoying abnormality;
– being aware, usually reduced to linear models, and to “normal” one-cause-one-effect chain for the convenience of analyses.

For example, the following model of man-man relationships (Fogel & Uchoa-Branco 1997, 65–92) contains communication and meta-communication, and implies undetermined changes. It consists of the following stages:

– getting acquainted
– establishing trust and intimacy
– maintenance
– decline
– rejuvenation or termination (ibid.)

Linear models of human relationships lose a theoretical potential. This is probably why Fogel (2006) rejected them in his late research. They do not explain the following characters of relationships theoretically:

– nonlinear, unpredictable shifts of relationship flux, when an influence causes disproportional reply;
– lawful sudden changes in communication induced by subjective choices of participants;
– mutual coordination and attunement of participants resulting in a new joint system;
– multiple causes-and-effects in relationship between participants;
– simultaneous phenomena and coincidences in couples or in a group, including, for instance, actions based on silent mutual attunement without verbal agreements;
– irreversible changes and growth of the inner order in the participants after having been in relationships.

Psychologists busy with relationships and human development “come face to face with complexity, nonlinearity, and context-dependency every day” (Smith & Thelen 1993). Nonlinear models are quite different in content and applications. On one hand, the nonlinear dynamics is complex. On the other hand, the use of a complex mathematical apparatus in psychological research requires complex and ordered psychological knowledge. This problem remains one of the unsolved methodological tasks in psychology. Without deep psychological knowledge,
there is no possibility to use complex scientific tools. But, without approved complex scientific tools, it is impossible to gain deep psychological knowledge. How can we solve this problem?

Let us take a brief look at the history of the fundamental sciences in the last hundred years. Psychology was oriented to “hard” sciences for a long time and used their methods and methodology. It is strange that psychological research is still based on old methodology. Nobel Prize winner I. Prigogine (1980) divides the historical dynamics of the methodology of the fundamental sciences into three stages: A, B and C. The description of the stages with comments are here below.

A) Psychological experiment in 20th century was based on the methods of physical experiment and Newton-Cartesian positivistic methodology. Any subject of research was viewed as an objective and homogeneous closed system. It is situated inside the same closed system – a large space-container – a homogeneous medium, or environment. Such system grows in the number of elements, using the additivity principle. The complexity of such a system is linear, growing “step by step”. Each process in that system is theoretically reversible. The worldview of this stage is also known as philosophical atomism.

The ideal systemic equilibrium is leveling the energy between the system and the medium, the environment. Self-regulation is the simplest and aims at a mechanical equilibrium of the object-environment interaction without the interchange of mass and energy. This is a “mechanical equilibrium”, “mechanical self-regulation” and “mechanical order” without changing system borders. In such a linear order, we can predict the behavior of the system at any time: one cause always generates one effect. The Cartesian rectangular coordinates are used to describe system behavior. This reference frame is fixed on an investigated object, and it is situated in an empty box of three-dimensional empty space. There is an additional linear time axis with objective historical “time” – chronos – divided into conventional equal pieces – seconds, minutes, hours.

The observer’s position is strictly divided from the studied object. This position is called “objective” because of the belief in the independency of the object’s behavior from the researcher.

People are seen as isolated from one another and from the environment, relationships are elusive. Untied people behave occasionally and show
random event laws, given by probability theory and mathematical statistics. Research methods in psychology are based on these notions.

A psychological example of early behavioral approach, close to the reflex theory of I. Pavlov, is given by A. Fogel; “physical communication, such as a moving ball strikes a stationary one, communicating information in a form of momentum and direction of travel. …Communicative information travels between neurons in the central nervous system via chemical and electrical signals” (Fogel 1993, 26).

B) The development of the research methodology goes through the thermodynamical and electro-dynamical systems. The flux of heat, gas, electricity and plasma moves through the system boundaries; the deformation of substance by boundary forces is studied intensely. Theoretical descriptions of energy-substance dynamics are developed. The worldview of this stage is under different philosophical influences – from positivism to phenomenology.

The thermodynamical system strives for thermodynamic equilibrium. It is a more complicated system than the mechanical one, even if it consists of elements. For instance, the “thermodynamic equilibrium” is the energy-mass equilibrium in heat movement between the thermo-dynamical system and the environment. So, interchanges of mass and energy between the system and the environment are obligatory for system functioning. A fast development took place in mathematical physics, describing energy-mass flux by differential equations, and oscillating system theories. The mathematical view became phenomenological, and quite successful applications have been elaborated.

The self-regulation of those systems is the active automatic control of homeostasis, keeping a stable dynamical equilibrium. There is no development and change yet, but it can happen randomly. The systems are much more complicated than in stage A. For example, the blood circulation in the human organism cooperates with the nervous system and manifests a complex system with the mass and energy flux and constant feedback.

At this stage in the 1940s’ to 1950s, Cybernetics, Information Theory and the Theory of Entropy with applications appeared. They showed close connections to the General System Theory of von Bertalanffy. They became very popular because of combining scientific strictness with intuitive and heuristic potential. Most of the research was focusing on finding some invariant laws. New ways of thinking – mathematical and quasi-mathematical
(so-called *system thinking*) modelling – became widely spread. Expectations for their great contributions to life sciences were high.

*Reference frames* became the overall tools used according to the geometrical and system model demands. The three-dimensional Cartesian coordinates with abstract time changed scales to more sophisticated ones. In quantum mechanics, matrix models and wave equations mobile and multi-scale reference frames are used in conjunction with every investigated “element” at any scale of the research. Changing the system to a sub-system or to a metasystem is natural, and causes complex movements of the reference frames and their mutual connections. One fixated reference frame for all the cases manifests the immutable viewpoint. If it is not a particular case, then it becomes *archaic* and useless.

In psychology Kurt Lewin created his field theory and vector psychology, based on the tension system notions. In helping relationships, the existential-humanistic and Gestalt phenomenological concepts and systemic family therapy theories appeared. A well-known study of the origins of schizophrenia in the family relationships (involving Bateson’s Palo Alto research group) was among them. However, they were not actively using models of this stage to their full potential.

C) Prigogine called the previous stage of scientific development *classical dynamics* (1980). Einstein enriched it theoretically by his theory of relativity and deep penetration into the matter, space and time structure. At stage C, however, quantum mechanics and optics, and ideas of relativity influenced scientific applications more than in previous times. “Elementary sub-particles” demonstrating unpredictable behavior were interpreted as arguably conscious. The main characteristics of the quantum systems – “wave functions” made of energy and frequency – excited the minds of many social scientists.

Quantum mechanics yielded a *new scientific perception* of the world, matter and space, agreeing with the new, stage C, macro-level scientific views. It showed that on the micro-level, but in the whole of the Universe, *there are no solid “particles” building “stable” material objects any more.* A quantum world never remains the same as it was a moment before. This scientific revolution, called a “quantum leap”, in its own scale of perception asserts that

- matter is neither a solid state nor an absolute basis for any “objective” knowledge;
time is not something linear nor general or homogeneous, but structurally connected to space;
the positivistic “objective world” in perceiving, research and interpreting substance behavior and common life has no more general scientific power;
metric standards of measurement are particular cases of comparison or/and interaction between different wave lengths of diverse systems.

In that research scale, it becomes clear that any measuring attempt, any intervention of a researcher changes a measured system. The result of the measurement depends on the chosen tool and the scale of measurement and on the performance of the measuring intervention.

The phenomenology of dynamic systems with energy-substance interchange have acquired nonlinear features. They have become more complex and flexible, and to describe their dynamics, nonlinear mathematical equations are needed. They manifest open complex systems, as predicted by von Bertalanffy.

Self-regulation and self-change became the main feature of the complex open systems. They are hierarchical and multi-scale, with nested and penetrating sub-systems and metasystems in constant interchange. They are self-developing through inconvertible sudden changes. The nonlinear dynamical systems of this scientific stage are multilevel, multidimensional and fluctuating. To study a complex system requires a consciousness of the same complexity as a system (Schreider & Sharov 1982).

Prigogine (1980) called the new stage of physics describing a flexible multi-scale world the physics of becoming. Kurdyumov (Knyazeva & Kurdyumov 1992) called the same methodological shift in science the new holism. Phenomenological philosophy, constructivism and even postmodernism describe this shift. The new holism is directed to investigating any kind of open systems with a growing complexity. These systems show irreversible changes. They are unpredictable for an external researcher because of their instability and bifurcations – qualitative changes, descending from inside the systems. They shape and express themselves by the energy/structure interchange at any scale of their perception.

The state of the investigated system should be followed from its control parameter (independent variable), having its own rhythm of change, and dependent variables shape the system dynamics by that rhythm.
The methodology of scientific research changes from linear to nonlinear. Stages “A” and “B” still reflect the naïve linear worldview and thinking. In psychology, Freud and classical behaviorism with their linear and atomistic model of human being without developed relationships belong to stage A. Consciousness was an unnecessary concept. The linear model of the relationship appeared in the concept of A. Adler, which represents the move in psychology to stage B. The models and philosophy of the cognitive approaches to helping relationships (A. Beck, A. Ellis) belong to stage B. However, K. Rogers’s, F. Perls’s and J. Bugental’s concepts were born as aware oppositions to the Freudian atomism and hard clinical conceptual roots. They move the psychology of relationships from stage B to C. Focused on the relationship experience and structure, avoiding linear ideas, they need a new scientific methodology and conceptual apparatus. Perls’s concepts, for example, are full of contradictions because he uses linear concepts for understanding nonlinear phenomena.

Stage C is difficult for psychology. For instance, Csikszentmihalyi (1991) uses Prigogine’s nonlinear theory to describe the person-world relationship in general. Avoiding man-man interrelationships, he does not use a huge potential of the nonlinear approach, originally devoted to the research of cooperative effects of different nature (Prigogine 1980; Haken 1977). Fogel (1993), Fogel et al. (2006) applies nonlinear terminology when describing mother-infant relationships. The lack of the nonlinear methodological view is compensated by changing the terminology to linear. Therefore, it is necessary to describe the nonlinear methodology in more detail.

3.2 Nonlinear dynamical systems methodology for relationship modelling


A brief description of the nonlinear dynamical systems is a compilation from the conceptions of several authors (Abraham 1995, 1997; Arnold 1990; Haken
in common understanding, man prefers order and avoids chaos. This
everyday viewpoint is far from the dynamical systems. The complex open
systems show intention to create order out of chaos, and realize it in relationship
with the complex environment. The concept “chaotic” in general has two
scientific meanings:

- indeterminate, random processes, such as the Brownian movement in physics;
- determinate, ordered processes, but born by complex laws of nonlinear
dynamics in nonlinear continuum in different scales of its perception.

The second aspect concerns nonlinear systems. These systems mostly interchange
energy rather than substance with the environment. Nonlinearity in a system
means that the system generates a disproportionate reply to a disturbing
intervention. Nonlinearity shows qualitative inconvertible changes in the system
structure and order, and in the structure of connections between the system and
the environment. The main changes of the nonlinear system happen between
order (cosmos) and disorder (chaos), and the disorder in one scale could be order
in another.

An interconnected and constantly functioning organism constellation is an
example of the nonlinear environment. Chaos appears when weak excitations do
not fade but are intensified energetically. For example, a weak need, intention or
mood becomes suddenly stronger. Weak turbulences easily outgrow into strong
ones because, as mathematicians say, a turbulence flow has many degrees of
freedom and, thereby, it is surprisingly flexible.

The order of a system can be of two types:

- An order of equilibrium is similar to the homeostasis principle; the system
  resists disturbances and activates the simplest self-regulation. The main
  characteristics (parameters) of the organism and the environment are equal.
  There is small energy income from the environment or from the absence of it.
  Resistances in psychotherapy are examples of the order of equilibrium. The
  linear thinking follows this kind of order only.
- An order of disequilibrium rules when the states (parameters, characteristics)
  of the system and of the environment are different. An example of this state is
  the “steady state” of Bertalanffy, which is often mistakenly reduced to its
  particular case, i.e. homeostasis. There is an obligatory energy interchange
with the environment to offset the losses of intensive restructuring: otherwise, the system will “fall down” into the order of equilibrium.

The nonlinear system is a natural development of the open system concept of von Bertalanffy. The system transforms as a result of the activity of the environmental dissipative structures (Knyazeva & Kurdyumov 1992). Nonlinear systems develop under the influence of the environmental structures of a special kind, called attractors (ibid.). Attractors are of several types – periodic, quasi-periodic and strange.

1. Point attractor (periodic).
2. Limit cycle of different types and complexities (periodic or quasi-periodic).
3. Torus attractor (transference from quasi-periodic to chaotic).

A psychological open system with one control parameter (governing independent variable) in its development could pass through all this attractor sequence (Abraham 1995; Arnold 1990). Nonlinear system development is restricted by the environmental structures complementary to attractors, which are called repellors (Abraham 1990; 1995; Arnold 1990). The repellors form barriers to process expansion. If the repellor is combined with the attractor, it is called a saddle or a saddle point. The attractors and repellors organize so-called basins around them (ibid.).

Simple types of nonlinear dynamics can be depicted using phase trajectories, or trajectories in the phase plane, obtained by getting a solution of a system of two ordinary differential equations (Akhromeeva et al. 1985). When the solution of equation tends to periodic function, we are entering a qualitative theory of dynamical systems (ibid. 14–15).

Philosophical and applied research of nonlinear dynamical systems entails discussions between different schools of nonlinear dynamical systems. For methodological use in “soft” sciences, Moscow State University and Institute of Applied Mathematics of Russian Academy of Sciences’ researchers (Akhromeeva et al. 1985; Knyazeva 2001; Knyazeva & Kurdyumov 1992; Kurdyumov 1986; Malinetzky 2000) have formulated the basic principles of complex open nonlinear dynamical systems in dialog with I. Prigogine. They add important nuances to the
systems view, making them closer to the human relationship with the world and the others. Here we quote the condensed principles in our translation.

1. The developmental paths of complex organized systems cannot be obtruded from the outside. It is necessary to promote own developmental tendencies of the complex systems.

2. Chaos and instability accomplish connections between different levels of order (organization, stability). At proper moments of instability, a small skillful ruling of fluctuations can raise a system forming organized macrostructures.

3. There is a spectrum of alternative developmental paths for complex systems. Only the system itself can choose the path at the branching, or bifurcation points. So, the system is built by its succeeding order rather than from its former historical steps.

4. The whole of the actual system cannot be compared with its former “parts”: the newborn system is qualitatively different from them. The nonlinear history, thus, is different from its narrative manifestation.

5. The concordance of the former parts into integer of the whole is implemented by tuning to one common development rate, to a common rhythm; this is the mutual attunement and coordination of the system constituents.

6. No external obliged force, but proper resonance influences on the complex systems are very effective in interacting with them, helping them to change.

7. There are special laws of fast avalanching (peak) processes and of development of self-stimulation inside the environment; it is also nonlinear.

8. Environmental dissipative structures support or suppress the self-growth processes (Knyazeva & Kurdyumov 1992).

The nonlinear environmental continuum reflects the features of a psychological force field (Lewin 1935; 1936; 1938) and of “continuum of awareness” (Enright 1980; Lebedeva & Ivanova 2004). The environment “in posse” (potentially possible) “contains diverse kinds of process localizations (diverse structure types). The environment is a specific unified source, a carrier of diverse forms of future organization, a field of multiple-valued development paths” (Knyazeva &

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*There is an alternative version of resonance influence concept – a synchronous influence, suggested by Pikovsky et al. (2002). It is based on different modelling of dynamical systems’ boundaries and taking into account localization of energy source of a system. We trend to agree with Pikovsky and to use concept of synchronous influence.*
Kurdyumov 1992). Thereby, the environment is a potential process. Each manifested environmental “structure is a process localized in appointed areas of environment. In other words, it is a process having certain geometric shape …able to reconstruction and movable over environment” (ibid. emphasis added).

The next step of unfolding the environmental characteristics shows that “Structure (organization) is a process, or else a stain of process roving inside the environment” (ibid. emphases added). The authors come close to the ontological view of S. Frank. They affirm that what we actually view in the research of the nonlinear system, i.e. event, structure or interaction process, totally depends on our perceiving intention. We can add that the specific perceiving intention entails a corresponding reference frame dynamics of the researcher. The perceiving intention causes directions and forms of active intervention into the perceived system.

Thus, if we see the self as the object, we will interact with the object distinct from the environment, designing reference frames and relationships accordingly. However, if we see the self as the alternation of the process and event, we will interact either with the process-in-environment or with the event-inside-environment with the reference frame dynamics in accordance. We also see our connections to the environment and to the process. Thereby, we are responsible for our perception in the system research, mathematical, physical or psychological.

The methodological position – the new holism – is more complex than the cybernetic or the information-oriented concept of dynamical systems. The latter one is in use in cognitive sciences (Haken 1977; 1996).

The environment as a web of complex connections (Capra 1996; 2002) has sources, drains and functions inside a structure. Therefore, Kurdyumov’s research team uses the word “Environment” typed with capital “E” (in Russian “Sreda” with capital “S”), implying its deep potentials. Thereby, the attractor is a present manifestation of the future state of a dynamical system. It is a localized metastable process in the environment (Knyazeva & Kurdyumov 1992). It attracts and organizes and shapes a system by hidden forces coming from outside of “that moment” topology of environment (ibid.). Therefore, attractors are not only the stable moments of phase diagrams (Abraham 1990; 1995) or patterns (Fogel 1993; 2006). They are rather “real structures in open nonlinear environments, towards which the evolutionary processes of those environments are tended owing to the attenuation transitional processes. Emphasizing that we are making use of new formation, integer – structures-attractors” (ibid.; emphases added). Nonlinear
processes are intermediate, and more complex than pure structures-attractors. The “actual structures-attractors, intentions or goals” (ibid.), and general development tendencies of their processes, allow to predict common process features, but not a finite content (ibid.).

The new holism methodology, on one hand, is intuitively proper for explaining and solving many difficulties of scientific modelling of the complex man-man relationships in general. On the other hand, the latter interpretation of the nonlinear system properties has actual similarities with the widely described theoretical basis of relationships in the Gestalt approach and in Lewin’s dynamic psychology. Therefore, we will use the Gestalt models of relationships and Lewin’s theoretical findings as a basis in designing the nonlinear units of the relationship.

3.3 From linear to nonlinear relationships

The survey of relationships in previous paragraphs shows that a linear description is inadequate and cannot reveal complex content and qualitative dynamics. We suppose that there already exist nonlinear relationships models, but that they are not denoted as nonlinear.

The following structural model of contact cycle is used in training courses for Gestalt practitioners (Saint-Petersburg Gestalt Institute, Russia) (Fig. 7).

The content of human-environment relationships is clear in the figure (Fig. Fig. 7). In linear models, the concept of “novelty” is interpreted differently across theories. Lewin (2001, 125) uses it in his deliberate action dynamics as a motivational factor. In Goodman’s contact cycle diagram, novelty describes the fore-contact phase; and in Zinker’s theory, it describes the sensation and awareness phases. Here “novelty” means subjective novelty; perception and recognition of something as a novelty, novelty awareness. This figure is based on the presupposition that any relationship of an individual to the world is a creative process (Zinker 1977).

Subjective novelty entails an excitement by novelty and a growth in human energy. It indicates the readiness of the individual for further creative activity in new environment. The person is ready to be excited by novelty. Acceptance of novelty, however, can be different.
When a person accepts novelty, a new situation is provided, too. This is a way of adjustment to a novel situation, and a way of inevitably influencing the situation of the person. It may be risky. Therefore, there are two choices. This choice-making phase of structural diagram corresponds to Lewin’s second phase. For Goodman, this is the moment just before the contacting phase (the decision-making phase, or the phase of intention), and, for Zinker, before the energy/action phase.

This is the moment of nonlinearity in the structural model (two simultaneously possible ways of acting). The choice is unpredictable for an external observer. Decision-making, in addition, is a state of instability, and is manifested as healthy anxiety before the choice. If a person accepts the risk of the consequences of the situation, creative adjustment starts. If, however, s/he rejects new situations because of unknown influences, this is another choice: closing the boundary, avoiding possibilities of change.

One of the founders of Synergetics, Haken (1988), has developed an information concept, which contains “novelty” in the same meaning. The classic Gestalt approach is interested in anxiety (Fig. 7) as avoidance of actual novelty. Transition from excitement to making a choice between two possibilities – creative adjustment versus anxiety – is a very famous situation within the existential context: “do I permit the world or others to have unknown influences on me?” The choice-making instability of the individual is denoted mathematically as a bifurcation point.
If instability-anxiety is not an overall actual experience, the psychological state will, paradoxically, become more stable. Involvement in a novel situation results in higher self-efficiency. In all likelihood, anxiety is not depicted in the diagram after excitement in spite of its influence on the bifurcation point as a psychological instability and a precursor of qualitative psychological change. Unaware avoidance of involvement in new risks produces a fixation on anxiety, producing an overall experience. Anxiety forces the individual to identify with an unstable state. This leads to further lowering of self-awareness and self-reliance.

There are two ways to produce a steady psychological state and to make a choice. However, this is a new instability, indicating nonlinearity. One possible choice is resistance. Resistances “close” the individual from risks of change in novelty. Novelty fades. The other choice is to increase awareness in spite of anxiety. Re-focusing attention on novelty and increasing awareness of new possible influences helps to accept risk and to continue a creative adjustment (Fig. 7, upper second branch).

The specific content of a relationship is seen after each choice or bifurcation point. The chosen path in the diagram – from both novelty and creative adjustment, or from the anxiety – reveals the relationship process and its results to the observer. This structural model of the contact cycle with bifurcation sequences shows many phenomenological similarities with theoretical curves in nonlinear dynamics called period doubling bifurcations (see Fig. 8).

Fig. 8. Complication of steady cycles flocking after period doubling bifurcations (see Akhromeeva, 1985, 25; Schuster, 1984, 49).
The horizontal axis “r” in this figure corresponds to the control parameter of bifurcation sequences. The vertical axis “x” corresponds to the magnitude of dependent variable. When “r” reaches r1, r2 or r3, the external observer cannot predict functional changes in x, because these latter depend on field fluctuations. Fluctuations influence the choice of one of the bifurcation curve branches. The relationships’ fluctuating organization goes in a similar way. The horizontal axis of bifurcation in the diagram (Fig. 8, “r”) or the horizontal direction of the structural model of the contact cycle (Fig. 7) corresponds to changes in the control parameters’ magnitudes. A control parameter’s growth has decisive influence on the process flow (Fig. 7 & 8). In Gestalt approach, the main variable leading to a successful relationship flow is awareness.

The main task of a helper is to organize awareness growth for their client about his/her relationships. An external person organizes awareness when individuals have low actual possibilities to do it themselves. Using the language of nonlinear dynamics, professional helpers focus on finely organized fluctuations. However, the responsibility of making choices, which changes personal life, depends on each individual.

3.4 Transition from linear to nonlinear description of relationships

A deeper and wider view of a psychology of relationships based on nonlinear dynamical systems is needed. To elaborate here, we use Lewin’s (1951) field theory and Parlett’s (1991; 1997) interpretation of it, as well as Perls, Hefferline and Goodman’s (1980) theories, and Zinker’s (1994) awareness model.

Concepts closely related to our research topic, and introduced in the previous chapter, include:

- **The self.** It is observed as the continuous wave-like activity of the individual between the self-center and the environment. There are at least two dimensions. The first is the experience of ongoing events (the Id-function of Gestalt-approach). The second is the alternating involvement into and withdrawal from the environment, taking a specific position or role, which maintains the dynamical structure in flux (Personality-function).

- **The self-center** is the presumptive manifestation of the metasystem of the self, “the I” (Perls 1969a), coinciding with the motivational center (Zinker 1994). Motive is impossible without the origin of the motive; the self-center. It governs the net of centralized motivational-integration functions (ego-
functions of the self; “ego” is an inappropriate rusty denotation), involving awareness, control of self-environment wave-like activities and choice-making.

- **The field of psychological forces.** This is the complex and partly invisible connectedness between the self and the environment, which realizes activity between them. It reveals itself in directed relationships of the self with actual needs or goals. The *actual field* is a realization of the *intention of personal tension system*. The fields-activity happens, therefore, between the self-center and the need or goal of action, in relationships between self-center and other(s), with actual (individual or joint) meanings and sense.

- **The individual intention** is a tension system striving to act (Lewin 1935; 2001). It connects a *witness* position of the self with a specific need or goal, constituting a psychological vector force. Witness position (Lewin 2001) is possible as a metasystem of the self (self-center), the origin of intention.

- **The actual rhythm of self-system.** The rhythm governed by the metasystem of the self or by the self-center, which results in a wave-like activity of the self. The rhythm involves identification/alienation of the witness’ reference frame: moving from actual self-identity to the subject (or object) of current attention and back. Rhythmic interactions happen within the self-phenomena (thoughts, senses, emotions, inner disturbances, etc.) or/and beyond self-boundaries in life space.

- **The rhythm of the system of common relationships** in the interactive cycle (Zinker 1994) is complex. It involves the rhythmic oscillations of common reference frames of a couple or group’s organism as a whole, and the self-rhythms of the participants intertwined with the rhythm of the common system.

- **The contact** is a mode of self-centers’ connectedness to the environment and others by means of the self and self-functions. It follows intention and psychological field appearance, and goes in a wide range of identification-alienation regimes. It combines contact boundary activities and witness reference frame movements.

- **The contact (relationship) boundary** is a multidimensional structure subordinated to intention. It is a dynamically-structured, complex psychosomatic domain and allows energy-substance interchange (“conductivity”) between the individual and the environment. The contact boundary involves the self-structures and participants’ self-experiences of relationships more deeply than in the theory of self of Gestalt approach. The
question of ownership of boundary in intensive contact is a theme of future research.

- The self-change depends on the awareness of self-constituents (experiential and structural constituents, Id- and Personality-functions of self in Gestalt approach) and their fine organization in relationships. Moreover, it depends on the activity of the witness reference frame, and thereby, on “being with” experience. A witness reference frame’s wave-like movements are connected to attention and awareness, and follows identification/alienation processes. They are running inside the field of psychological forces through self-boundaries, or beyond the organism self-boundaries in I-You ontological self-transcending (meeting by Buber).

- Resistance (defense) alternating by presence is a polar mode of the self-boundary and the self-center’s coordinated activities in the environment. These activities reveal the presumptive self-center (“the I” by Perls), or motivational center (Zinker) or, more precisely, the motivational-integration center of the self. The different extent of access to self-center, the different presence levels (Bugental 1987) manifests different grades of the creative “function of organism to discover” (Perls 1969c).

Mutual influences between the self and the environment, thus, are governed by covering-uncovering (discovery as a particular case) the access to deeper self-activity and self-awareness. The conductivity of the multidimensional self-boundary structure shows either the resistance against the presence of environmental influences or the acceptance of their presence (including the influences of other selves). Neither resistance nor presence are dysfunctions of the Ego (Goodman 1951, 1980). They manifest a conductivity (or access) dimension of the self-centers’ guidance and are responsible for creativity.

We need these functions to eliminate biological analogies from the classic Gestalt theory that strive to linear simplicity and to an order of equilibrium. It is necessary to move to more complex but adequate notions, embracing the complex self with the field of relationships. The concepts are mostly rooted in Lewins dynamic psychology and findings of the Gestalt therapy and the existential-humanistic approach (Bugental 1987). They help to understand relationships when combined with nonlinear dynamical notions and with an order of disequilibrium. Many of them are already tacitly present in models of contact.

For example, the concept of witness reference frame increases the awareness of a subject by indicating the actual self-identification points. The same can be
said about awareness of personal mood or subject of interest. However, “as if” identifications of Perls (1969a) are the mere cognitive-imaginative preconditions of holistic identification. Holistic identification/alienation takes place by being with/without, and by experiencing the subject. Only this kind of identification results in awareness, a holistic comprehension. Therefore, it is possible to localize the witness reference frame’s wave-like regular activity between the actual focus of attention and the self-center. This is in agreement with Jaspers’ model of attention (Jaspers 1963). This also contributes to a better understanding of the field structure and dynamics of relationships.

3.5 The nonlinear field of human relationships

We briefly sketched some benefits of the nonlinear approach above. A scientific analysis of lawful flow of relationships is only possible by using a nonlinear approach. Prigogine, one of the founders of modern nonlinear science and methodology, has studied nonlinear environments, and introduced the concept of dissipative structure. This is a structured field of energy-substance circulation taking place in natural dynamical systems. It was discovered in experimental research in nonlinear thermodynamics (Prigogine & Stengers 1988).

Classical dynamical structure – for instance, hot water in a kettle – tends to move toward thermodynamic equilibrium. The energy of hot water dissipates in the environment until an equality of temperatures between the kettle and the environment is reached. From this viewpoint, it is presupposed that a human being always loses energy while it is at work. In Lewin’s model of deliberate action (2001, 125), the tensions discharge at the third phase and are an example of classical dynamical equilibrium.

In contrast to classical dynamical systems, the thermo-dynamical systems investigated by Prigogine show another type of order. They are not completely controlled from outside. Nonlinear thermo-dynamical systems, in contrast to linear systems, manifest energy redistribution. It results in a structural order – a structured energy circulation between system and environment. This phenomenon is called “dissipative structure,” and it keeps the system in states far from a thermodynamic equilibrium. In “Benard cells,” for instance, a dissipative heat flow builds up an order of super-molecular organization (Prigogine & Stengers ibid.). In the Gestalt therapy of families, the organization of mutual awareness entails a higher order of family relationships too (Zinker 1994).
Modern scientific methodology accepts dissipative structures of environment (Knyazeva & Kurdyumov 1992) as the simplest mechanism of relation (Prigogine & Stengers ibid. emphasis added; see also Capra 1996; 2002; Knyazeva & Kurdyumov ibid.), as communication itself. Haken (1988) showed a conversion of the coherent oscillation of atoms into a coherent, unified field of relationships. This is similar to non-interpretive perception experience of infinite fields of relationships, described by A. Watts (1969). Capra (1996) calls dissipative structures “revolutionary new concepts” from the viewpoint of classical science. He emphasizes the characteristics of “sensitivity to small changes in the environment, the relevance of previous history at critical points of choice, the uncertainty and unpredictability of the future.” He asserts that these characteristics manifest a nature as sensitive as a human, and make dissipative structures “the basic structures of all living systems, including human beings” (ibid. 192–193). This prompts us to see human and environment as more akin to one another than is usually regarded. Consequently, we will suppose that “dissipative structures” can be used as a scientific analogue of the field of human relationships.

Dissipative structures constitute an energy-substance interchange in states far from thermodynamic equilibrium. Their stability and changeability depend on several conditions. In the simplest case, they depend on mutual adjustment of three obligatory factors:

- **Function**;
- **Spatial-time structure**, appearing with instability;
- **Fluctuations**, starting instabilities (Prigogine, 1980).

If they are able to adjust, dissipative structures will have to develop; if not, then the structure will remain the same (ibid.). This is in agreement with the conception of multidimensional environments as a dissipative structure (Knyazeva & Kurdyumov 1992).

Lewin’s definition of field as “space, conceived as having a certain characteristic at every point” (Lewin 1936, 216) is a basic linear conception. Since a field of relationships is a particular case of nonlinear dissipative structure, it is possible to apply these factors to the psychological field of relationships. The actual field of psychological forces should include both the individual and immediate environment. In general, the field of psychological forces may be constituted from three characteristics:
- **Function** of psychological forces is seen in the metasystem’s efforts of coordinating and controlling. It regulates the dynamical order of relationships between the self and the environment: connecting and disconnecting of attention and awareness to self and/or to environment, intending, controlling boundary conductivity, connecting/disconnecting the self to other(s), nature and world of objects – to those who and what is chosen as making actual effect (Lewin).

- **Spatial-time structure** of psychological forces. This provides the *structural stability* and executes relationship dynamics; the structure involves actual psychological interconnections and influences – both aware (with clear subjective sense and actual meaning) and unaware. This corresponds to Lewin’s life space definition.

- **Fluctuations** are initial instabilities in relationships, which change their dynamics irreversibly; they include internal disturbances of unfinished doings (urging by valences of Lewin as a particular case), of need with a hidden meaning or sense, or external influences of fine organization of relationships by a professional helper.

It is possible to notice that the Gestalt approach, with its combined linear-nonlinear notions, offers all these constituents to describe the self in its relationships. The three functions of self (Id-, Personality- and Ego-function), connected to self-boundary structure, are working for a disturbance or fluctuation result – for figure appearance and satisfaction. However, with the concept of dissipative structure, constituents belong to relationships and cross individual boundaries.

This is a turning point from both Robinson’s loneliness and the Cartesian isolation to the connectedness of individuals by means of dissipative structures of actual relationship fields. The concept of “field” presupposes connectedness starting from human relationships: *there is no self without field of relationships, and vice versa.*

If we focus on an individual’s relationships or psychological forces using Lewin’s approach, we have to first define each specific individual’s choices and point of view. In Zinker’s (1994) detailed holistic description of couple and family relationships, the field of psychological forces belongs alternatively to the individual and/or to multi-individual organism. Therefore, a classical Lewinian connection of field-to-individual reference frame is not enough.
We can compare the linear and nonlinear description of relationships as shown at the Figure 9.

Fig. 9. Common easy mode of depicting the whole of interpersonal relationships.

Any meaningful constellation of individuals (Rogers 1961), family system (Minuchin 1974), or communication system (Watzlawick et al. 1967) involves self-change processes in both the relationships and the participants. Close interpersonal relations are invisible in Allport’s sense, but they are perceived as a meaningful network (see Fig. 10). Relationships in social work, group psychotherapy, training (Yalom 1995), and community life are all studied through ties between participants. Thought experiments isolating only one tie between two participants and other ties between other participants will also change in tension.

Fig. 10. Honeycomb cell constellations depicting interpersonal relationships having more than two dimensions (see also Fig. 11).
Linear ties between participants help to explain connectedness and interdependency of people in education, psychotherapy and counseling. There are some restrictions when we think about the actual freedom of any participant in real life, even if connections are static. The degree of freedom of each participant is two-dimensional (Fig. 9), and qualitative shifts in linear ties are not possible. If we use “Benard cells” as the possible model of relationships between nearby selves, the same relationships have a spatial honeycomb cell constellation (Fig. 10 & Fig. 11).

Honeycomb cell constellations allow the description of well-organized complex relationship structures with more dimensions, and more degrees of freedom (Fig. 11), than the linear constellation in Fig. 9.

Dissipative structures with nonlinear spatial-time dynamics involve functions of organized relationships, spatial-time structure of possible matter and energy interchanges, and fluctuations in relationships. The same relationships’ ties as in Fig. 9 include energy-substance circulation in relationships (Fig. 11, arrows), going on in a direction athwart to the plane of linear ties (Fig. 9 & Fig. 10).

Fig. 11. Re-direction of dissipated energy for between-cells order organization.

Energy circulation forms the spatial-time order of relationships between the participants, giving more degrees of freedom to participants. However, energy/substance dynamics (Fig. 11) between the participants are not visible in the plane pictures in Fig. 9 and Fig. 10. Therefore, when we move from linear connections in relationships to spatial-time in the nonlinear dynamics of “Benard cells,” some new features of relationships appear.

First, the energy of relationships, usually seen as shared and dissipated, and therefore lost in classic dynamical description, is redirected to organize a new
spatial-time order in relationships, manifested as relationships themselves. Relationships do not make order: relationships are the dynamical order of connection between people.

Second, easy behavioral control of relationships, indicated by linear ties, becomes insufficient in a nonlinear spatial-time model (Fig. 11 & Fig. 12). There is a need to discover the metasystem governing the relationships of the “distributed subject”.

The nonlinear thermodynamic order in the original “Benard cells” appears when a difference of temperature between the upper and lower layers of liquid (Fig. 11) gains specific magnitude and then dynamically maintains at the same range (Prigogine et al. 1988). This temperature gradient is called the “control parameter of the nonlinear process.”

![Fig. 12. Possible depiction of ordered human relationships dynamics in the nonlinear field of psychological forces, by analogy of the nonlinear dynamical system of “Benard cells”.

The control of human relationship dynamics, for instance in the Gestalt approach, is realized by the helpers’ efforts to organize awareness and mutual awareness. The control parameter in organizing individual-environment relationships corresponds to self-awareness of the individual phenomena; of self-experience, self-structure, self-activity, etc. The control parameter of relationships between people, or in “distributed subject” may correspond to mutual awareness, which subordinates and penetrates the self-awareness of all participants.

In the case of interactive cycles, Gestalt therapy strives to reorganize the participants’ self-energies into a coherent flux with synergy between their
activities. Visible individual boundaries are completed by the mostly invisible circulation of generalized individual energies through common contacting self-structures. Coherent energy-action flux simultaneously goes through all participants of relationships. This explains why people in a group, for example in play activity or in family life, understand each other in action without words.

3.6 How do the psychological forces and the tension system change?

We already discussed Lewin’s concept of a vector of psychological force. A nonlinear field of psychological forces is arranged as multiple vector-forces, each defined by mobile point of application and point of origin. Therefore, the direction and magnitude of forces changes both qualitatively and quantitatively. Conceptions of phase portrait or phase space are needed to model the nonlinear field of psychological forces. They depict the trajectories of phase points, of psychological states, which are changing in lawful flux (Abraham et al. 1990; Arnold 1990).

How can we follow the dynamics of psychological forces?

We have already introduced two different nonlinear models of relationships. Now a general phenomenology of the flow of relationships is needed, which allows seeing complex relational dynamics as a whole event. This makes it possible to differentiate the details without losing the connections between the constituents.

Lewin’s tension system can be a basic concept used to describe a whole relationship event. Lewin and Zeigarnick proposed that intention is a tension system, which appears in concrete situations, serves human activity and strives for discharge (Zeigarnick 2003, 244). According to Lewin, the person is a differentiated region in a life space (Lewin 1936, 166–167), a system, considered “in regard to its state of tension” (ibid. 218). Tension is the state of person as a system relative to the surrounding regions in the life space (ibid.). Forces at the boundary between a person and the immediate environment create tension, which “tends to produce changes such that differences of tension are diminished” (ibid.).

This localized individual tension system is the main whole event, which we try to develop in the current research using the language and principles of nonlinear dynamical systems.
Tension on between-regions boundaries described by Lewin and used by Perls as boundary tension, tend to discharge on the boundary. These authors saw the boundary of the individual system as the place of continuous self-activity. The figure above shows the tension system of a person in “relations between various strata of the person …under stress in state of self-control” (Lewin 1936, 181). However, Lewin used a biological cell analogy to describe the live tension system.

Lewin unfolds the inner constituents of the person by degree of access to influences: “the peripheral parts $p$ of the inner-personal region $I$ are less accessible…; peripheral and central parts ($c$ and $p$) are more closely connected; communication between $I$ and $M$ (motor region – I.S.) is less free” (ibid.).

Locomotion (changes of position) shows individual intention forcing the self to cross the boundary. The contradiction occurs when the tension system is defined as tension on the boundary.

Even if a boundary becomes a motor system ($M$), before reaching a goal the field forces picture should demonstrate tension towards that goal, but not tensions between regions inside/on the self-boundaries. Lewin (1935) uses vector magnitudes, but it is not clear how tension systems can be transformed into vector forces in the environment. Strictly speaking, there are no clear tools of contact between self and goal, or need beyond the boundary before locomotion begins. It cannot begin without overcoming the boundaries. Heckhausen (1991, 116) points to another side of this problem when he mentions exterior vector magnitudes and scalar (absolute, non-vector) magnitudes interior to Lewin’s model of the self.
As we see, contradictions concern the tension system and classical dynamics thinking, which Lewin and Perls tried to combine. They tried to describe motivated activity as dynamical process, striving for discharge and as an organism event aimed towards homeostasis.

Votsmeier (1996) suggests a different understanding of psychosomatic equilibrium: “the motivation of human beings towards development, change and renewal cannot be understood by a concept of organismic self-regulation as striving for an equilibrium. However it can be understood as striving for a sort of medium tension determined exclusively by the particular nature of the individual.”

The old homeostasis concept is the simplest model of organism regulation, a particular case. Applied to the conscious self as a whole, it leads to contradictions in self-regulation in general, and the understanding of boundary regulation in particular. The organism’s self-regulation tends to reduce tension and to maintain a dynamical equilibrium in Lewin’s sense. Nevertheless, the “I-boundary” (by Votsmeier) regulates in a different dimension: “contact-regulation (self-defining, acting adequately etc.) and the so-called contact-interruptions… tend towards maintaining a dynamical disequilibrium, in maintaining one’s specific identity and individuality” (ibid.). Therefore, we need to use different modes of human regulation between equilibrium and disequilibrium.

Thus, needs-satisfaction in the classical Gestalt therapy, by Votsmeier, is merely a subset of realizing the selves’ potentials, revealed through meanings and sense of life. Motivation is therefore a “motivation to realize ones identity and individuality, in short: one’s sense of oneself” (ibid.). It entails the overcoming of actual self-boundaries as a main self-activity (ibid.; emphases added).

Lewin’s attempts to build up the person model on the basis of topology was criticized by Heckhausen for its absence of connections to the field, and its reductionist move in depicting inner tensions (Heckhausen 1991, 116–128). A different direction of the motivational force changes the meaning of contact interruptions and the direction of field connections. Before asking about contact interruption, it is necessary to find out which direction of the self-activity on the boundary is going to be interrupted? Or, by Votsmeier, “how someone is interrupting one’s realization of one’s particular nature, of one’s identity, of one’s sense of self” (ibid.).

To follow Votsmeier’s arguments it is necessary to understand better the different views of ties between tension in Lewin’s tension system and boundary state. The following holistic aspects of the Gestalt theory are crucial for this because of their co-ordination with Lewin’s model of a person (Fig. 13):
- Symptoms, as other psychosomatic phenomena are manifesting a best possible realization of the persons’ individual nature. Resistance is a mode of protection from anxiety and hurt, and thereby from a loss of identity and integrity.
- Splits (isolated domains) within a person, but not resistances, are major disturbances to be resolved through helping relationships.
- Working on the integration of self-functioning as a whole is working on a base of connections between contact and support, including mental meaning-making (the abstract attitude by Goldstein) towards integration processes. (Votsmeier ibid.; emphases added).

Meaning- and sense-oriented understanding of resistances (interruptions of relationships) are complementary to the lawful relationships oscillations. This is similar to Zinker’s view, who wrote, “no matter if we deal with the ‘cooperative’ or ‘resistant’ sides of the organism, we have a tendency to move toward its motivational center” (Zinker 1994, 119; emphasis added). Zinker and Votsmeier define a new dimension of interpreting relations. One pole of the dimension is a self-overcoming and self-restructuring to fulfill actual meaning or sense. The extreme development of the pole ascends into self-transcendence. Frank (1997) describes this as ontological self-creativity. Nikolay Berdyaev (1993) called this self-realization as existential-ontological fulfilling of The Creative Task. The Creative Task disturbs the human being from inside through an anguished sense of discrepancy of “everyday creativity” (ibid.).

On the other pole of the meaning-making dimension is self-integration, the result of change. It is based on the first holistic aspect.

The second holistic aspect of splits (isolated regions, by Lewin) reconstruction is not just a specific psychotherapeutic task. The different basis for different experiences and knowledge, gained in developmental and educational personal history, can be examined by questions such as, “what remains as actually self-integrated and developing in the self after relationships in a field of education and/or getting professional help?” The second aspect unfolds the degree of freedom for the reference frame of the self to move inside self-boundaries in search of prior “split” or/and appropriate developmental intention. Lewin’s important spatial-time tool of witness position and its’ different self-identities in different situations (Lewin 2001, 87–93) make the degree of freedom possible. A mobile witness reference frame also makes mobile the position of the individual inside a relationship flow. Changes in witness positions allow for new degrees of
freedom of the self, moving the reference frame of perception and action inside the life space. For this, it is necessary to redefine a vector of psychological force (including intention) in flexible nonlinear field conditions by:

1. The current point of origin (the I, in particular) responsible for the origin of self-intention (aware and unaware) towards goal or need.
2. The current point of application, which is responsible for the current focus of attention and intention to act; the need or goal in the life space inside self-boundaries or beyond them.
3. Strength/energy in the tension system; change of strength following the lawful change of current point of origin and a current point of application.

Three constituents define a current trajectory of psychological force in general. The third holistic aspect is associated to three important sides of the theory of the self. First, connections between contact and support in relationships are connections between foreground (actual forces of the field configuration) and background (actual fields in the whole of life space). Mutual support connected to mutual awareness in relationships is a necessary precondition – a background – for further good flux of relationships. Zinker (1994) denoted this mutual support as a “common ground” for participants. It could be designated as multidimensional supportive dissipative structure (field) of psychological forces in common life space. However, it may also be named a joint personality-function.

Second, we have already met a version of the connection itself, intertwined circulation of a boundary energy and awareness (Fig. 12). Now we can add that common meaning or/and common sense govern relationships through the supportive field connections. Third, personality function is no more the isolated “current role” or “self-conception”. It is the conductor of the energy of activity between the self-center and the environment, a relationships mode, a dynamic relatedness of the self to the environment or/and to the other. In the language of nonlinear dynamical systems, personality-function is a dissipative structure of the self-environment (selves-in-environment) system. It is a dynamical connection mode.

A tension system is connected to valence (Lewin) by intention. Valence in a structure of “central field” (Lewin 1936, 218) is a psychological force directed beyond homeostatic self-boundaries. Valence manifests a point of application for psychological forces, originated in a person and situated beyond self-boundaries. The intention towards a charged point of application originates in the self, and the self-center controls it. The point of application, by Lewin, can only actually exist.
Now it is possible to answer the question of the paragraph, how do the psychological forces and the tension system change?

A spatial-time and functional structure of a tension system in general includes the self-center, the self with its functions and boundaries, and the need, goal or aim in the environment beyond self-boundaries. All these are connected by tension between the self-center and subject of valence in the environment and arrange a field of psychological force(s) and, thus, occupy a life space.

A law of change in trajectories, or a specific law of change in psychological forces – Lewin’s main matter of interest – can be given by describing the whole dynamics of a nonlinear tension system. In nonlinear modelling (Knyazeva & Kurdyumov 1992), a psychological force is not something abstract in an empty space, but a specific force in specific conditions of the self (selves) and the environment. The metasystem of the self regulates self-conductivity (resistances/presence) of psychological forces; the self makes changes in the environment and in him/herself. Therefore, a tension system cannot be restricted to individual boundary, but boundary is included inside of the self-environment or selves-in-environment tension system as a pre-condition of interaction.

The self-environment tension system from “the first person singular” position (Perls 1969a) is organized between the individuals’ actual self-identity (point of origin of current psychological force, in particular, “the I”) and the need or goal within a specific context. The tension system is experienced inside (point of origin, or reference point of tension and motivation) and beyond (point of application) individual boundaries in the totality of life space. It is sufficiently connected to the spatial-time dynamics of witness positions inside life space. Thereby, the old concept of self-boundaries is changing in common with the tension system and psychological force. The last nonlinear example of a dynamic field of relationships (Fig. 12) gives a version of boundary structure based on energy circulation.
3.7 What do we expect from nonlinear models of relationships?

*Concepts of vector psychology should be operational, allowing immediate use*
Kurt Lewin 1935

*Conception of helping relationships should be understandable*
Frederick Perls 1969

“New holistic” and nonlinear ways of thought have fundamentally changed the economy, sociology and the sciences. On the one hand, progress in science and methodology provokes researchers and practitioners to use a new scientific language and to modify the old one. On the other hand, classic languages have kept their strict classical foundations in various domains. It keeps research activity connected to the roots of scientific school, and demands using a classic terminology and notions. This always causes instability in science, but at the same time stimulates development.

In the present situation, we need to know how to use metaphorical language to describe relationships through notions of nonlinear dynamical systems. The following questions have to be answered:

- Can we apply nonlinear notions and language to describe relationships as they are used in “hard” sciences?
- Will nonlinear language meet the expectations of being understandable and operational?

To analyze relationships using conceptions from “hard” sciences is not enough. This is a methodological problem. It seems obvious to use nonlinear models and the phenomenological language of nonlinear mathematics and physics to explain psychological phenomena (Abraham *et al.*, 1990; Abraham, 1995). However, this forces researchers to trend towards a pure combination of nonlinear dynamics phenomenology and statistics in their study (Guastello 1987; 1995). Moreover, the statistical type of defining conceptions and, thereby, statistical idealization of psychological phenomena is not appropriate for the research of dynamical systems with similar phenomena (Andronov *et al*. 1959, 15–19).
Statistical methods belong to the “Aristotelian mode of scientific thought” with indifference to individual cases (Lewin 1936, 2–21). Nonlinear dynamical models are related to the phenomenological position, and are quite close to the “Galilean mode of scientific thought” (ibid.). This latter focuses on lawful changes in individual psychological phenomena, and is based on a principle of validity of a single case (Lewin 1935, 40). Therefore, the nonlinear model is rather a tool for describing an individual psychological event with its subjective constituents. In qualitative research, statistically proven psychological conceptions overlooking individual features cannot play dominant roles.

Psychological conceptions of the nonlinear model of relationships have twofold use; first, in the common scientific meaning and, second, in the individual, or subjective, meaning, which allows immediate understanding. That is why we cannot use a readymade mathematical model for a mere theoretical description of relationships. It is necessary to make them accessible to subjective comprehension.

However, a twofold use of these conceptions has definite limitations. On the one hand, it depends on the awareness skills of individual and metaphorical richness of language. On the other hand, it is restricted by subjective deepness of unspeakable and limitations of scientific terminology.

Nevertheless, it is necessary to use language and conceptual thought in science. In order to answer the second question it is necessary to address a subject who understands and operates.

In expressing the experience of “the first person singular” (Perls 1969a), it is important to describe dynamically the characteristics of self-experience and subjective change from a witness viewpoint. I. Fromm and F. Perls have experientially discovered the operational tool for the implementation of the awareness process by a professional helper. It demands changing the mode of expression from noun to verb. Instead of saying, “it seems a difficulty in this action,” the helper suggests that his client say, “When I act that way, I do it with difficulty”.

There are several advantages of this way of reasserting.

Firstly, responsibility moves from an abstract acting object (“a difficulty in this action”) to a real acting subject (“I act” and “I do”).

Secondly, awareness and change happens by uncovering a point of reference of the current psychological forces, of their origin, or of the current self-center of actor.
Thirdly, a subjective change as a concrete process is shown: “An activity (sensing, remembering, anticipating, speculating) is something other, than its content (the memory, anticipated event, theory, etc.). This is of fundamental importance in the development of the awareness” (Enright 1970, 266) for making change. This is also a basic condition for experience-oriented dynamical modelling.

Thus, personal change is accomplished by “concrete attention to detail, rather than abstract conceptualizing; doing with organismic involvement, instead of talking about; and accepting responsibility for one’s own behavior instead of denying, projecting, attributing, displacing, etc” (ibid. 271).

Consequently, an understandable and operational nonlinear model of relationships resulting in change is possible if:

- a process language (verbs, not nouns) is used to describe subjective experience,
- a description is based on experience of a witness, of a “first person singular”, who endures the experience.

The use of verbs and dynamical process notions results in some extension of the researchers’ subjective involvement in the investigated processes. The researcher’s presence allows for a co-experiencing relationship. The change in perception of connectedness entails a change of experience of this connection flow (Watts 1969). The connectedness between researcher and the problem under research demands awareness of their mutual influences. The researcher becomes a responsible constituent of the investigated relationships system, and thus, a research agency. This is a kind of qualitative research which requires exercising special skills from the researcher (Kvale 1996; Padgett 1998).

In positivistic research, the researcher’s position is the opposite: he is an “objective” observer. He heeds skills of attentive judge, who decides if the investigated phenomenon belongs to true conceptual knowledge or not. This is a means of eclectically applying a nonlinear model to statistically proven psychological conceptions. From a field theory viewpoint, or from a systemic and holistic viewpoint of human relationships, it is an ineffective way of getting complete knowledge (Bertalanffy 1979; Dilts 1994; Lewin 1935; Schreider & Sharov 1982; Parlett 1991).

Doing research of relationships dynamics by merely observing relationships is a theoretical abstraction. A nonlinear dynamics approach suggests how to solve the contradiction between qualitative research interventions and positivistic
nonintervention. One of the constituents of dissipative structure (in any nonlinear
dynamical system) is fluctuation, which brings change. If the presence of the
researcher makes fluctuating intervention, it changes the system’s own process. If
his presence does not change the dynamics of the system, it is nonintervention.
The researcher’s awareness of his presence extends to interventions, making or
not making change in the dynamics of the examined relationships.

It is necessary to describe the nonlinear unit of relationships in order to obtain
advantages from the use of nonlinear dynamical systems. The unit should depict
the following:

- Relationships as a dynamical tension system, by sense and/or meaning in
  context, causing intention to fulfill need or goal.
- Relationships as a process with quantitative and qualitative changes.
- Relationships as experiential events of mutual penetration of individual
  participants, as experiencing of different levels of presence.
- Relationships as wave-like activity and/or transformations of
  1. attention and awareness;
  2. witness reference frame;
  3. self-experience (Id-function of the self in the Gestalt approach);
  4. self-structure (self-boundary in particular; Personality-function of the self
     in the Gestalt approach).
- Relationships field as a nonlinear structure conducting psychological forces
  between the metasystem of the self and the environmental subject, or/and
  between different selves, their metasystems and environmental subjects in life
  space.

3.8 The nonlinear oscillating system as the unit for relationship
description

The main task of our research is to develop the nonlinear dynamical model of
relationships flow, and to show its potential compared to linear ones. The Gestalt
approach and some positions of the humanistic-existential approach to helping
relationships are used. Relationships from that combined viewpoint reveal wave-
like dynamics, organized by awareness, mutual coordination and attunement.
Relationships flux experiences and conceptual basis of their oscillatory
phenomena are widely described. The actual level of individual presence, awareness and choices form a balanced whole in the model.

Andronov et al. (1959) and Magnus (1982) define the oscillation as the regular variation of some measure in time around a central variable (Magnus ibid. 11–14) or between different states of two or more systems (Andronov et al. 1959, 15–45). Oscillations occur in all natural systems and in human society.

In relationships with the world and others, especially in helping relationships, it is possible to track the oscillation of many variables. These variables include: self-conception’s (Personality-function) changes, oscillations of attention and awareness orientations between intrinsic and extrinsic zones, oscillations of self-energy (Id-function), alternations of activity zones between intrinsic and extrinsic, changes of individual meanings with changing situation (a poly-semiosis – a variety of meaning production, according to Ginger), oscillations between resistance to environmental influences and presence with them (or wave-like presence changes), attunement-detunement alternations in couples, mother-child and group relationships, etc. Some of the oscillating variables are functions of governing by self-activities in relationships, and rooted in the metasystem of the self.

In applying the nonlinear model to the wave-like activity of the self (or selves) it is necessary to know the main characteristics of dynamical open systems. Such system is a self-sustained oscillation system, or a nonlinear oscillator.

3.8.1 The phase portrait of oscillating relationships

Three properties define the nonlinear oscillator or autonomous dissipative self-sustained oscillation system:

- The transformation of energy from an inner source into the rhythmic activity of the system, with the possibility to attune to other oscillating system.
- The structural features of a system that determine the oscillation mode and are independent of entry conditions.
- Self-oscillation rhythm constitutes a steady dynamical state, which can restore the amplitude after removing a disturbance (Pikovsky et al. 2003, 28).
A nonlinear oscillator is a generalized model, describing rhythmic phenomena in systems of different physical nature (Kuznetsov 2002a, Pikovsky et al. 2003). The study of oscillation in different systems shows its principal unity (Haken 1977, 1988; Kuznetsov 2002b). Therefore, it is possible to study the self in relationships as nonlinear oscillators in nonlinear dissipative fields.

The simplest oscillator is linear and its main characteristics are particular cases of nonlinear ones. The change in the energy of the self in time during complete psychotherapeutic session is shown in Fig. 14. as two different linear oscillators.

The linear oscillator describes a dynamic of relationships as successive phases alternating one after another in time T. Goodman’s contact cycle (Perls et al. 1980) is described using the same sequential logic as in Zinker’s cycle of experience (1977) (Fig. 14). Various authors have explained many nonlinear features of contact dynamics verbally, principally because a linear oscillator model does not give such possibilities. Moreover, they not use available knowledge on linear oscillators. It is necessary to fill this knowledge gap.

Since a linear oscillator is basic for nonlinear description, we describe its main characteristics. They are the rhythm (frequency), the phase and the amplitude (Pikovsky et al. 2003, 27–28). In addition, each oscillator has an autonomous source of energy, which transforms it into a rhythmic activity.
1. The rhythm of oscillator is described with two alternative scalar (non-vector) characteristics. One is a period of oscillations: it is the time needed for passing one complete cycle of change (the time for one complete revolution of radius vector at Fig. 15).

![Diagram](image)

**Fig. 15. Phase and amplitudes of rotation and results of their disturbances in simple linear oscillator.**

It is a time of duration of complete play relationships, for instance, of one psychotherapeutic session or complete educational communication between student and teacher. The period is a main rhythmical characteristic of periodical or quasi-periodical (nonlinear) oscillating systems. Often it is convenient to use another rhythmic magnitude – the number of oscillations per unit of time, called oscillation frequency. It shows, for example, how often a child gazes at a partner during a given period, or it might be a clients’ respiration rate in an important episode of a therapeutic session.

A human being is undoubtedly a complex autonomous system with many intertwined and mutually coordinated rhythms. But it is necessary to pick up some generalized rhythms, or autonomous frequencies (Pikovsky et al. 2003, 28–29). These latter implicitly connect other self-rhythms. In helping relationships, for example, a general emotional state dynamics is preferred. Holistic “energy of the self” manifestations are mainly nonverbal and affective. In addition, in the contact cycle of Gestalt therapy, one cycle of affective functioning is related to attaining one actual need or goal, and the realization of one intention (Fig. 14).
Therefore, we accept the generalized affective rhythm of the self (the rhythm), submitted to actual intention. It accords with the Id-function’s lawful change along one cycle of relationships of the Gestalt approach.

Secondary school geometry helps to imagine a picture of this frequency. If we look along the horizontal axis $T$ from its terminus (or from the right side of Fig. 14) to the oscillating cycle of experience (by J. Zinker), its plane projection will be exactly a Fig. 15. The generalized affective rhythm of one self-environment relationships event, thereby, accords to how many complete revolutions a radius vector will show per unit of time. In the easy case of a linear oscillator, there will be one rotation per one complete relationship event (Fig. 14).

2. The phase is another significant characteristic of oscillators. It is not obvious, though, what exactly corresponds to this phase in human relationships dynamics. Therefore, it is necessary to examine the scientific description of phase before determining its psychological interpretation.

In the simple case, at the phase portrait frame, a phase is a concrete part of a total period of oscillations (large white curved arrow at Fig. 15). In a two-dimensional picture, it is measured in absolute magnitudes from a conventional zero point (horizontal axis) in a counterclockwise direction. It repeats after each total period of rotation. In other words, the phase of radius vector at phase portrait (see also Pikovsky et al. 2003, 53: Fig. 2.3) is the plane angle of the radius vector’s rotation at that moment.

It is convenient to mark the observed point of oscillation at that moment – for instance, a current psychological state of the self in relationships with the environment and/or others – by a small dark grey circle at the terminus of radius vector (see Fig. 15).

In relationship descriptions in general, and also in helping relationship theories, the conception of phase is commonly used (Perls 1969a, 1969b, 1969c, 1973; Zinker 1977, 1994; Stern 2003; Fogel 1993; Fogel et al. 2006; etc). However, each psychological school uses the notion of phase with its distinct contextual meaning. This “hard scientific” meaning of phase does not coincide with the phase of relationships in the Gestalt-approach, although it reflects its meaning.

We study the oscillating dynamics of relationships using plane diagrams, called “phase portraits” in nonlinear dynamics, and three-dimensional diagrams, called “phase spaces”. We suggest a strict division between a few meanings of the noun “phase”.

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The first meaning of phase belongs to the phase portrait of the oscillator (Fig. 15). We call it a phase of phase point, having in mind a mathematical depiction of the phase points’ position at phase portrait. Any disturbance of phase of rotation moves a phase point (Fig. 15: “lagging”) and causes a phase shift. This phase is neither stable nor unstable (Pikovsky et al. 2003, 53–55), and therefore, it keeps the phase shift invariable until the next shift. This gives advantages in coordination between different oscillating systems, such as between people, which we will see later on.

The phase of “phase space” and “phase point”, however, has a second contextual meaning, described in the List of definitions (see also Pikovsky et al. 2003, 52). We will not mark out the use of this meaning in our current research to avoid complication of narration.

The third meaning of phase is used in the Gestalt therapy, and it relates to a lawful change in the modes of relationships, the Gestalt-phase. However, it also concerns the change of the nonlinear oscillator. In the theory of the self, different regimes of the Id-function of the self are found at different Gestalt-phases. For the second phase (contacting at Fig. 16), it is typical to try to develop different activity modes with an increasing intensity of experience. The third Gestalt-phase (final contact at Fig. 16) goes with full involvement in relationships and highest energy.

Fig. 16. Coincidences between the contact cycle of P. Goodman and bifurcation sequences of nonlinear oscillating system.
The first time we described a Gestalt-phase dynamics in a nonlinear system in our graduate work for qualification of Gestalt Practitioner (Saint-Petersburg Gestalt Institute, 1998; see Safarov (1999)) we showed, that:

- The four Gestalt-phases of P. Goodmans contact cycle coincide in general with four subtle bifurcations in so-called bifurcation sequences (Marsden & McCracken 1976; see also Abraham et al. 1993; Abraham 1995 (1997); Arnold 1990; Akhromeeva et al. 1985) (Fig. 16).
- Gestalt-phases change under the influence of specific attractors: the fore-contact phase develops submitting to point attractor, the contacting phase submits to a limit cycle attractor, a final contact, to torus (braid) attractor, and post-contact corresponds to strange attractor (chaotic attractor) (Safarov 1999, 60–63).
- Contact dynamics are governed by a control parameter: awareness, organized to attain need or goal and carried out with aware intention towards them (ibid. 61).
- The highest relationships intensity at a final contact phase demonstrates the multidimensional nonlinear oscillations between the self and the environment (ibid. 61–62).

The difference between the first and third types of phase shift in this study is that the phase of phase point (Fig. 15), supposed here as attention direction, is easily regulated by a disturbance in small-scale shift. It is in good agreement with one of the three constituents of attention developed by K. Jaspers (1963). Then the initial phase of phase point (Fig. 15) corresponds to the initial attention direction. A point of origin of radius vector, in the simple case of phase portrait, may correspond to the actual witness position.

Let us look at attention directions in phase space (Fig. 16: straight grey arrows). Attention directed to the self (and towards a point attractor) lawfully turns to attention directed towards the environment (and to the limit cycle attractor). Any kind of phase shift or disturbances (or fluctuations) will result in force changes of attention and activity modes.

3. The amplitude of a single radius vector is its current magnitude. As with the phase, it defines a phase point coordinate at phase portrait (Fig. 15) or in phase space.

Disturbances (fluctuations) have different influence on the amplitude and phase. In the simple case, at the phase portrait, amplitude reestablishes after the
removal of disturbance (see Fig. 15: “reestablishing”). In the phase space, the amplitude of radius vector of the phase point follows an attractor’s current shape.

The psychological meaning of amplitude, in our case, accords to the intensity of involvement of the psychosomatic self in relationship-activity. In that activity, it manifests a holistic mode of psychological and environmental expansion to the field – oneself, objects and other people. It involves attention-perception-action holistic oscillations of active self-structure. This ongoing work related most of all to the current Personality-function of the self (Ginger & Ginger 1999).

Therefore, we can call it the generalized amplitude of the structural activity of the self (the amplitude). Personality-function of self in the Gestalt therapy is a specific mode of the self-structure’s activity working at that moment between expansion and integration. From the viewpoint of dynamical systems it is a dissipative structure of the self at a given moment.

4. The energy. In the oscillating system energy income and energy dissipation could be different. When they are in a dynamical equilibrium and energy income compensates energy dissipation, a nonlinear oscillator produces stationary oscillations (Pikovsky et al. 2003, 60: Fig. 2.8). In case of human oscillating system, a balance between energy income and outcome gives increased order at the end of the contact cycle. This important result demands additional research using nonlinear methodology.

3.8.2 From the phase portrait to the phase space of relationships

The three main characteristics of oscillator are working when its energy transforms into rhythmic manifestations. They are all described by non-vector – absolute – magnitudes. At this stage of modelling, in place of the oscillator at phase portrait (Fig. 15) we need to use the nonlinear oscillator in phase space (Fig. 16), unfolding to bifurcation sequences: “Often changing a control parameter may send a dynamical system through several bifurcations… a point attractor bifurcates to a cyclic attractor, then to a braid, and then to chaos” (Abraham et al. 1990, II-96).

We should know the working forces in order to explain the energy transformation in the oscillator. Therefore, we need to know the momentary state of the nonlinear oscillator: its phase portrait (Fig. 15 & Fig. 17) depicted in vector form. Moreover, we need to know the vector correlates of the scalar magnitudes of the three main characteristics: the rhythm, the amplitude and the phase.
Is there any risk of losing the operational character of the model when we use vector magnitudes in a phenomenological model?

A phenomenological model can be derived from the theory, and also can be “considered autonomous. …Theory … serves only as one tool for model construction” (Hartmann 1999, 328). In our case, we use methodological and theoretical approaches taken from fundamental sciences and from helping relationships. We try to elaborate a practical model and hope that it will help to understand and use the theory better. In general, the phenomenological model applies theory, tests it, develops it and may replace it in use (ibid.).

Fig. 17. A momentary state of autonomous nonlinear oscillating system: phase portrait of a limit cycle attractor and of its basin.

The phase portrait of nonlinear oscillator (Fig. 17) shows movements of phase points, generalizing them into phase trajectories (Fig. 18). Thus, the phase portrait of nonlinear oscillator depicts oscillation tendencies at specific part of phase space.
In figure 17 we do not draw a single-phase point or single radius vector, or even a single point of origin for radius vector, as we did in Fig. 15. For studying oscillations, we should choose a phase point while taking into account present force field configurations at the actual type of attractor. A particular case of the force field – a limit cycle periodic attractor – is depicted in Fig. 17. The phase trajectories show phase point movement directions near the attractor in its basins (Fig. 17 and Fig. 18).

From these descriptions it is clear that the phase point at the phase portrait or in the phase space is a representative point (Andronov et al. ibid.); it represents current psychological state of the self (a totality of affective and cognitive constituents (Abraham, Abraham, & Shaw (1990); Abraham & Gilgen (Ed.) 1995)) in phase diagram.

In phase space (for instance bifurcation sequence in Fig. 16), the attractor’s configurations have influence on each phase point in the basin of attractor. This means that the psychological state of the self, denoted by a concrete phase point in a specific basin, is subjected to the attractors influence. Therefore, it is forced to approach to the dynamics of psychological states circumscribed by that attractor. To describe the dynamics of these influences of attractors, we need to transform the main characteristics of nonlinear oscillator into a vector form of generalized psychological forces (a detailed description of this conversion is a subject of additional research). We will also add their psychological interpretations.

The beginning of bifurcation sequences is the starting position of different relationships (Fig. 16: vertical axis; Fig. 19: home of XYZ coordinates). Let us consider a momentary state of some phase point (small grey circles O’ , O’’ & O’’’ at Fig. 19) in phase space. Energy from the oscillator’s inner source
transforms into the oscillating activity of a chosen phase point, starting with the \textit{rhythmic} (here – rotary or spiral) \textit{oscillations} and the \textit{amplitude oscillations}.

Any energy consumption results in force. In addition, any deceleration or acceleration of phase point’s movements in phase space means that the phase point is exposed to the influence of force (Andronov \textit{et al.} 1959). Therefore, we can mark two generalized main forces that influence the phase point in phase space. One \textit{generalized force} executes the rhythmic rotations of the phase point ([O’L] & [O’´L] in Fig. 19). The other \textit{generalized force} executes amplitude oscillations of the phase point ([O’M] & [O’´M] in Fig. 19) \textit{on the way towards the attractor}.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{phase_diagram}
\caption{A fragment of phase diagram of bifurcation sequences before the point attractor.}
\end{figure}

In phase space, each vector-force has a constituent directed along the OZ-axis, up to the growth of the control parameter. Therefore, a vector-force of amplitude and a vector-force of rotation, their “main” functions notwithstanding, cause the rise of the control parameter.

The general picture of an oscillator’s dynamics is the following:

The vector-force of rhythmic rotation [OL] executes \textit{the rhythm}. Its tangential constituent [O’L´] does the \textit{main} work in the rotation. It is always remaining on the plane parallel to XOY (Fig. 19). The additional work of this vector-force, manifested in the affective rhythm, directs the movement of the phase point

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towards the attractor along the OZ-axis. This is a vector [O’L’]. Its direction coincides with a direction of the vector of intention towards the current attractor, and the control parameter’s growth direction.

The vector-force of amplitude oscillation [O’M] executes different modes of psychological and environmental expansion of the oscillator to the field. This constituent’s main work is to oscillate back and forth between the center and surround ([O’M’] in Fig. 19). Additional work connects the phase point to the attractor, and coincides with the attention focusing direction and with the control parameter growth ([O’M’] in Fig. 19).

The phase shift vectors come from previous description. The phase shift at the plane of phase portrait is executed by the additional work of both of the considered vectors. Nevertheless, it is not obvious. At a phase portrait (Fig. 15), a phase shift coincides with the rotation direction of the radius vector. Theoretically, a radius vector’s shift – the plane phase’s easy change at phase portrait – realizes the attunement of the system to the environment or other systems (Pikovsky et al. 2003). Psychologically, a shift at the plane picture (Fig. 15) could mean that relationships are attuned and executed by mere affective activity. However, it does not correspond to everyday or professional experiences in education and helping relationships.

For phase diagrams in phase space (Fig. 19), this conclusion from the plane picture is not accurate.

Sensation and awareness phases in human-environment relationships (Zinker 1977; 1994) precede full-scale self-activity. In the sensation phase, the self is busy in attentive self-research of disturbance (fluctuation) inside of self-boundaries rather than by an examination of the environment.

However, attentive self-research inevitably involves body movements and changes the psychological state: no perception without action (Arnheim 2004; Zaporozhets & Zinchenko 1982). Thus, attention and self-research are connected with “the amplitude,” depicted by the vector [O’M] (Fig. 19). Strictly speaking, change of attention direction (vector [O’M’]) in phase space entails changing of the entire vector of “the amplitude” [O’M] (Fig. 19). In its turn, it changes the other constituent, the vector [O’M’]. Thereby, the phase shift (disturbance or fluctuation) entails an additional shift along OZ-axis (Fig. 19), and results in change of control parameter.

On the other hand, disturbance (or fluctuation) makes the system unstable. Instability forces the system to oscillate towards an attractor in the current field. In psychological thinking, the point attractor corresponds to a figure – urgent need,
goal or significance of action. The reorientation of attention inside self-boundaries towards disturbance results in awareness (shift along OZ-axis, Fig. 19), and transforms disturbance to the figure – a point attractor.

Consequently, the constituent of phase shift along OZ-axis is a vector-force of attention reorientation with increasing awareness. It corresponds to the structural attunement of the self to the attractor. From the Gestalt-theory view, it accomplishes by connecting the witness position to figure by a specific Personality-function. In other words, the vector [O’M’) presents the activity of the self in his/her focusing of attention on a figure (Fig. 19).

It is remarkable that attention work is a constituent of the oscillations of the whole self-structure. It explains the total focusing of attention of holistic self-involvement onto need, goal or significance. This is in good agreement with the research of flow state by Csikszentmihalyi (1991).

Phase shift executed by the vector-force of rotation (the frequency work) corresponds to the energy growth with attention reorientation to figure. A small change of frequency follows it. In other words, rotational phase shift in the model corresponds to energy/frequency attunement to the attractor. Psychologically, it is getting extra potential (energy) by the current Personality to execute attention-focusing for contact with the figure (attractor). This energy growth is not yet excitement.

The phase shift vectors, thereby, are two. Disturbance of the oscillating system of the human is a disturbance of his/her current structure (Personality function, “the amplitude”). It results in the reorientation of a vector of attention and its growth towards disturbance. Focusing on disturbance transforms it by awareness of the actual attractor.

The same disturbance is a disturbance of “the frequency,” a vector of rotation in the model of the human oscillating system. Psychologically, it causes extra potential (energy) for work of contact with the figure/attractor, a potential for focusing attention on figure. The vector of energy shift is co-directional to the vector of attention. Thus, it manifests attention concentration force for contact with the attractor.

It is possible to make a preliminary resume of vector forces acting in nonlinear oscillating systems of the self. There are three paramount directions of vector forces, acting in phase space, when the dynamics of the nonlinear oscillating self-system are far from bifurcations.

The vector-force of the rhythmic rotation of the oscillator is responsible for self-energy manifestations (Id-function of the self). It works mostly in a
tangential direction of psychological forces in the concerned phase space. For convenience, we can call a vector constituent of the rhythm a **tangential psychological force** ([O´L´´] in Fig. 20 A).

Fig. 20. Radial, tangential and axial psychological forces (A); axial psychological forces only (B) in phase space.

The vector-force of amplitude oscillation executes the expansion of the Personality-function and the structural change of the self. When it is **far from bifurcations**, it works mostly towards and from a motivational-integration center. It oscillates and makes work in radial direction of psychological forces, perpendicular to OZ-axis. Therefore, we can call the vector constituent of the amplitude a **radial psychological force** ([O´M´´] at Fig. 20 A).

Two of the phase shift vectors, the vector of attention ([O´M´] at Fig. 20 A&B) and the vector of energy, which make contact with the figure/attractor ([O´L´] at Fig. 20 A&B) are co-directional vectors, and directed along the control parameter growth, or along the OZ-axis (see also two dotted-line vectors along OZ-axis at Fig. 20). We can call them **(axial) vector of attention** ([O´M´] at Fig. 20 A&B) and **(axial) vector of contact** ([O´L´] at Fig. 20 A&B).

What does it mean to say they are “far from bifurcation?” The radial and tangential vectors work within the phase space’s dynamical conditions, which are **far from a qualitative change** of ongoing process. For the relationships stage depicted at the Fig. 19 and Fig. 20, it means that the figure (attractor) is not clear. Awareness of a specific Personality, or self-structure, and its specific experiences
is low; attention is not high. A total psychological force is incapable of making a subjective change.

What happens when the oscillating system of the self comes close to the attractor, or to qualitative change in phase space?

The trajectories of phase space tend to move towards a point attractor (Fig. 21). At the attractor, the radial, tangential and axial forces transform these trajectories into one revolving axial vector. This happens in the following way.

When the phase point in phase space comes close to OZ-axis, a tangential psychological force [O’L’] becomes almost co-directional to a radial psychological force [O’M’]. Fig. 21 presents cooperative work of tangential and radial forces as spiral structures. All the energy of the self is expended to transform the dissipative structure of the self.

Two axial psychological forces [OL’] and [OM’] (Fig. 21) come to a resonance and arrange a joint axial force along OZ-axis; this means a maximum possible focus of attention of the self at the attractor, the awareness, a total devotion to the figure/atractor.

Since vector-forces become pairwise-matched and co-directional right near the attractor, they connect the phase point (the actual psychological state of the self) with the attractor on the totality of energy belonging to the self. All the coherent vectors create a highest tension between the self and the attractor, and arrange a tension system of the self.

As was shown, intention is a tension system, which appears in a concrete situation, provides for human activity and strives towards discharge (Zeigarnik 2003, 244). Lewin, however, specified the location of a tension system differently: “Whenever a psychological need exists, a system in a state of tension exists within the individual” (Lewin, 1938 (1968), 99).

Where, then, does the tension system exist – within individual boundaries (Lewin) or in a concrete situation (Zeigarnik)?
Until awareness of the figure is born, the individual shows most of his attention activity within individual boundaries. However, investigating a figure, the individual could be in a situation or could have a situation in his/her mind. The same can be observed in school education, in play and in psychotherapeutic sessions. Clients do not bring to the therapist’s office a material situation with the objects and people. He is tied to the situation, and comes with experiences and concrete knowledge of it. The situation shows that the boundaries of the self extend far beyond its biological boundaries. A situation (Zeigarnik), thereby, is a totality of social events (in Lewin’s sense), producing actual effect on the individual. Situation, by Lewin, is a “life space or part of it conceived in terms of its content (meaning). The life space may consist of one situation or two or more overlapping situations. The term “situation” refers either to the general life situation or the momentary situation.” (Lewin, 1936, 217; emphasis added)

If the tension system does not exist in a situation, but merely inside the individual, it cannot work in the situation. If it exists both in the individual and in the situation, however, what is the connection between them?
We suppose that connections between individual boundaries and the situation are executed by *movements of the witness position* (Lewin 2001). The witness can oscillate between the individual in a situation, between “being with” and “being without” the situation or/and subject of interest. Gestalt-therapy experience, especially the Gestalt-experiment confirms this (Perls *et al.* 1951 (1980); Ginger & Ginger 1999; Lebedeva & Ivanova 2004). A meaningful need or goal is, thereby, connected to the situation by the oscillations of the witness’ reference frame and by their imagination. Then individual boundaries and the boundaries of situation will be common. Then we can state once more that the *tension system of the self is arranged between an individual and situation*, and that it started on the boundary between the individual and situation. The boundary conception in the nonlinear system of the self is more complex than a membrane-like border in the classical Gestalt-therapy.

A phase space is a model of an unfolding situation, where dynamical boundaries between the individual and the situation are drawn with specific character (shape) of the concrete attractor. The psychological meaning of a phase space coincides, in many respects, with the life space of Lewin.

*The vector of intention* resulting in the tension system of the self is a complex psychological vector-force, manifesting aware coherence between psychological vector-forces of three directions – between radial and tangential vectors, and between two axial vectors. This produces two effects:

- An established tension system of the self.
- The qualitative change in relationships between the individual and a situation takes place: the individual turns to the situation and becomes active on the basis of aware intention.

### 3.9 The self-in-environment as the nonlinear oscillator

The nonlinear oscillator of the self in the nonlinear environment (situation) presents a nonlinear phenomenological model of relationships, and becomes one of two units for relationship analyses. In a general relationships description, it is possible to represent the self-system *qualitatively* as going through the whole of four bifurcation sequences; four lawful qualitative changes in relationships. The dynamics of the nonlinear oscillator of the self develops towards Lewin’s notions about the individual tension system. Concerning phase space of the nonlinear
oscillator is almost coinciding with Lewin’s life space phenomenology, and represents an environment of psychological forces.

### 3.9.1 The environment

The psychological nonlinear environment is a complex multidimensional life space. The origin of psychological forces coincides with the individual’s actual witness reference frame, or with his/her current identification. It means that all environmental content, referential to the self – people, objects, ongoing events, etc. – is loaded with subjective meanings and attracts the attention of the self. The connectedness of the self to meaningful attractors in the environment organizes subsequent relationships, thereby changing the self and the environment.

Contact between the self and the world (and between other selves) is seen as executed by a *nonlinear field of psychological forces*. It is possible to select four main psychological forces of the self, which can describe the self-sustained oscillation system of relationships with the environment. An organized field of relationships shows a *common complexity* of the relationship’s constituents (Schreider & Sharov 1982); self and environmental content. Environmental response to the self, therefore, could be described using tangential, radial, and axial forces.

For instance, a child in pretend play selects the role of a driver. He has identified himself with a pretend driver, manifesting his actual *witness* position. He sees and feels the environment through the lens of pretend driver, starting with radial psychological force. He begins to move around in search of the “load,” “track,” and “steering wheel,” using tangential psychological force. He finds a load and a chair as a truck (meaningful attractor, organizing psychological forces between child and environment), using axial psychological forces of attention and contact. He disposes of the load on the bench. This is a nonlinear environment of relationships, unfolding in a situation, and allowing for the response to specific forces in a meaningful way.

But the child does not see the “steering wheel;” there is no appropriate object nearby. In nonlinear terminology, there is a lack of meaningful connection of the radial vector-force. A *meaningful restructuring of the environment* is needed to organize full connections between radial psychological forces of the self and an environmental object. However, the child has enough attention and energy of contact to expand to the environment (a tangential vector-force and two axial vector-forces), organized by the idea of play: he turns a bicycle upside-down, and
makes a bicycle wheel the “steering wheel” of an imagined truck. Thereby, he organizes a full connection of radial vector-force (and, thereby, the chosen role) to the environment by himself. The tangential, radial and axial vector-forces in meaningful contact with the environment create a psychological force field and a tension system; thereby meaningful play starts.

3.9.2 The self

Each of the following descriptions can explain the self in a field of psychological forces in phase space:

- a system of high complexity (Bertalanffy 1979; Schreider & Sharov 1982; Lefevre 2000; 2005),
- a steady nonlinear process in the environment (Knyazeva & Kurdyumov 1992; Svirskiy 2001),
- a nonlinear dynamical system (Guastello 1995; Marks-Tarlow 1999; Capra 1997),
- a self-sustained oscillation system (Pikovsky et al. 2003; Kuznetsov 2001; Kuznetsov et al. 2002a; 2002b; etc.).

The nonlinear oscillator of the self is described by three main characteristics – rhythmic rotation (frequency), amplitude, and phase shift. Offering them as radial, tangential, and two axial vector-forces helps to describe the mechanisms of nonlinear development and the qualitative change of the self. Neither functions nor vectors are self-aware. Awareness of these functions and/or of vector-forces controls and reorganizes them. Attention redirection, choice making, change of witness reference frame, and awareness organization are metasystemic functions. Consequently, the self as a whole is a complex system with:

A) A metasystem of the self – a source of awareness, subjective meanings, intentional activity, deep spiritual potentials, and metasystemic tools of governing self-functions.

B) Phenomenological manifestations of the self – of the dissipative self-sustained oscillation system, the nonlinear oscillator. Psychological forces realize the functions of the self. The self replies to the environmental or inside-self fluctuations according to the contextual, subjective meanings of the situation.
A. The metasystem of the self governs relationships between the whole self and the environment. In an extreme case, it reveals the deep existential-ontological immediate self-being (Frank). It is complex, and executes many activities.

First, it oscillates, in deep existential contact, with the other immediate self-being (ontological being with). It is typically described experientially with the help of similar phenomena such as meeting (Buber), I-You relationships (Frank), and presence at intimacy level (Bugental). It means that the metasystem of the self – “the I” (Perls) – may relate to other selves’ metasystems.

Second, it realizes two modes of self-overcoming: “external self-transcendence” (Frank 1990) of I-You relationships (being with the other), which are supplemented by individual “internal self-transcendence” in contact with the “pure objectivity” of spiritual reality (Frank 1990).

Third, the metasystem of self starts the environmental activities of the oscillating tension system. Therefore, “the I” (the metasystem of the self, the motivational center (Zinker 1994, 119)) governs and coordinates the following functions of the self:

- subjective meaning making (Votsmeier 1996),
- awareness (Perls 1969a; Lebedeva & Ivanova 2004; etc.),
- deliberate reorientation of attention (Jaspers 1963),
- experiential (Id-) and structural (Personality-) functions of the self,
- intention (Lewin 2001; Zeigarnik 2003) and subjective change,
- identification – alienation of the witness (Lewin 2001),
- widening – stretching, opening – closing of self-boundaries (Perls 1969a),
- change of presence levels and attunement to other (Bugental 1987),
- integration (Zinker 1994; Polster 1995; Enright 1980; Lebedeva & Ivanova 2004),
- etc.

The implicit deepness of the self-center penetrates the whole self. Performance of the listed metasystemic functions, and the integration of experiences (Perls 1969a; Polster & Polster 1973; Parlett 1991), is accompanied by the restructuring of the psychosomatic self. The metasystem of self is in good agreement with Perls’ intuitive notions of the “potentiality” of a whole self, governing orientation and integration of perceptive-proprioceptive functions, motor-muscular functions and
organic needs, when the self is involved in the environment and unfolds through emerging behavior (Perls, Hefferline, Goodman 1980, 433–438).

**B. Phenomenological manifestations of the psychosomatic self** – is a complex dissipative structure of self, providing self-functions and contact-withdrawal oscillations (Perls 1969a, b, c; Zinker 1977, 1994; Ginger & Ginger 1999, etc.). The *theory of self* describes metaphorically its working conditions (Personality-, Id-, Ego-functions of the self) (Ginger & Ginger, 1999; Lebedeva & Ivanova 2004; etc.). However, psychosomatic self is an integral part, but not a whole of the self, as was regarded by the classic Gestalt therapy of 1950–70s.

We suggest four psychological vector-forces with three directions – tangential, radial and axial – to show how the dissipative, nonlinear system of self works.

Since self-functions are governed by a metasystem of the self, psychological vector-forces describe a controllable lawful flow *between the self-center and the environment*. It goes through dissipative structures of the self, and provides for the self-center’s aspirations at generating and fulfilling aesthetically sufficient holistic self-processes – Gestalt & Gestaltung (Parlett 1991, 1997); it accomplishes continuous connectedness oscillations to a continuum of awareness (Enright 1980; Zinker 1977; 1994; Polster 1995); it allows oscillations of attention – the main human energy (Polster 1995) – through itself and between the self-center and the environment.

Therefore, the self is a complex structure for the actualization of the potential (Perls, Hefferline, Goodman ibid.) *hidden in the self-center*. It is a self-center that imparts the self by rhythm and motion to manifest undiscovered potentials and meaningful self-expressions (ibid.).

### 3.9.3 The current and the joint intentions

The vector of intention (Fig. 22 A & B: \( O^\prime I \)) is a vector sum of the vector forces of rhythmic rotation (Fig. 22 A: \( O^\prime L \)) and of amplitude oscillation (Fig. 22 A: \( O^\prime M \)). We call it the *vector of current intention*. It has directions different from OZ-axis when it is far from periodic or quasi-periodic attractors. For instance, in search of a figure at sensation (Zinker 1977) or fore-contact (Goodman) phase, current intention works inside the self-boundaries, and its terminus is directed *towards* OZ-axis.
The first result of coordinated activity between a metasystem of the self and a psychosomatic self is the creation of intention and tension system.

Fig. 22. Vector sum of all psychological forces gives vector of current intention [O’I].

Fig. 23. The tension system creating bifurcation sequences of nonlinear oscillating system of self.
At the point attractor exactly before bifurcation, the direction of the vector of current intention coincides with OZ-axis (Fig. 21 and Fig. 23). Since it is arranged by the pairwise-matched and co-directional vector forces (see 3.8.2), and creates a tension system, we call it the vector of intention (in the case of human-environment relationships) or the vector of joint intention (in the case of man-man relationships). It has its only direction along OZ-axis, and coincides with the awareness growth direction.

3.9.4 The sudden change: how does it happen?

Sudden change happens each time all the psychological forces become pairwise-matched and co-directional (see 3.8.2), and when current intention’s direction coincides with joint intention’s one. Coincidence between tangential and radial forces’ directions on one hand, and between two axial forces’ directions on the other hand, happen differently at each attractor.

At a point attractor, a good contact of the metasystem of the self with the inside-boundary self happens, and it results in tension system creation. Between point and developed limit cycle attractors, the current intention and main work are directed at the environment. They entail good contact and active relationships with the environment at the limit cycle attractor.

At a torus (braid) attractor, relationships are quite complicated. The current intention vector disintegrates into its constituents and works through different psychological forces. Tangential, radial and axial vector-forces behave differently, but are intertwined into the “good form” (Zinker 1994) of a torus attractor. The torus (braid) attractor picture in phase space is a clear graphic depiction of the field of psychological forces in action. The forces’ work intensities increase and coincide with the (joint) intention direction many times in a short period. This means that relationships between the self and the environment are most intensive.

Current intention oscillates between two “sides” of a self-boundary – the self-structure and the environmental event. It integrates previous experiences, oscillating, in Lewin’s terminology, between inside boundary regions and the life space.
Fig. 24. Current and joint intention vectors in self-sustained oscillation system of self.

Joint intention (Fig. 24: black arrows with white edge along OZ-axis) manifests the holistic force of transformation of self-sustained oscillation system of the self, making it pass to bifurcation sequences with qualitative changes. Current intention vectors’ (Fig. 24: small dark grey arrows with a white edge) axial projections in the joint intention direction maintain the whole process. The current intentions provide specific dynamics to each attractor’s basin. While realizing a particular attractor’s dynamics, they re-orient current activity direction to each new attractor.

What is the general psychological picture of the relationships and psychological forces?

3.10 The unit for relationship analyses

We need to look at bifurcation sequences in order to see the whole of psychological dynamics and the details of human–environment relationships (Fig. 23 & Fig. 24; Fig. 25).

F. Abraham describes Freudian personality dynamics using analogous phase diagrams (Abraham 1995; 1997) with the rectangular coordinate as the axis of self-concept, Id and dependence. In current research, the self-in-environment, and
also man-man relationships in environment are described as a nonlinear self-sustained oscillation system in phase space, with its experiential and structural constituents. In Fig. 20 we depicted tangential ([O’L’’]), radial ([O’M’’]) and axial ([O’L’] & [O’M’]) psychological forces, resulting in intention vector ([O’I] in Fig. 22 & [O’I] in Fig. 25), in polar coordinates (Glass & Mackey 1988, Chapter 2; Kuznetsov et al. 2002a, 2002b; Pikovsky et al. 2003).

We use two identical types of description of human nonlinear dynamical system: the “self-sustained oscillation system” and “the nonlinear oscillation system” of the self. We also use three different forms of description to discuss the self-sustained oscillation system’s characteristics: Gestalt terminology, functional (scalar form) and vector form.

In Gestalt language the common psychosomatic self-system is composed of “The I”, (which is better known as Ego-function of self), Id-function and Personality-function. The last two functions present the actual experience of the self and its current mode of assimilating experience.

When we consider the whole self-in-environment as the oscillating system, we describe it by the functions of both the metasystem and the system. The functions are the amplitude, the frequency, and the phase.

We use the same characteristics of oscillating system in vector form when we describe tension system dynamics and have to operate with psychological forces. We replace the amplitude with radial psychological force, the frequency with tangential psychological force, and the phase shift with two axial psychological forces.

The bifurcations sequence manifests the dynamics of a whole self as nonlinear oscillating system with one general control parameter (Arnold 1990; Knyazeva & Kurdyumov 1992; Kuznetsov 2001, Kuznetsov et al. ibid.; Marsden & McCracken 1976; Pikovsky et al. ibid.; etc). It conveys the general oscillation dynamics as a single self-environment relationship, as selves-in-environment systems relationships, with the one control parameter of awareness.

In the case of a single self, the control parameter corresponds to current self-awareness in general, and in case of a couple or a group, the control parameter is mutual awareness.

Holistic contact between real self and environmental events by means of a psychological force field is possible merely because of the primordial identity of an organism’s nature – its structure, content and functions – and the nature of Environment (Svirskiy 2001; Knyazeva & Kurdyumov 1992; Watts 1969). The mutual recognition of dynamical systems makes contact possible because of the
closeness of their complexities (Schreider & Sharov 1982), and by the mutual attunement of their frequencies (Pikovsky et al. 2003).

3.10.1 The relationship between the single self and the environment

The simplest dynamics of an alive (Fogel & Garvey 2007) relationship between the single self and the environment, a contact cycle (Ginger & Ginger 1999; Lebedeva & Ivanova 2004; Clarkson 1989) (Fig. 22 & Fig. 24), or a cycle of experience (Zinker 1977) can be described as a self-sustained oscillation system.

Relationship between single self and environment begins from an environmental or inner fluctuation (disturbance). The registration of the disturbance as a nonlinear oscillation system of the self starts a relationship:

A – Sensation of the disturbance by the self is a fluctuation inside of the self; fluctuation may appear as inside or outside of self-boundaries, but the psychosomatic self registers it, and the whole of the self accepts it as sufficient and/or interesting.

Psychological forces begin their activity mostly inside self-boundaries. The awakening of self-experience (Id-function) corresponds to the psychological instability of the self-system as a result of phase shift. The experiential constituent of phase shift is a constituent of the frequency (Fig. 15). Therefore, tangential psychological force ([O’L']) at Fig. 20) appears with its’ axial constituent – an axial vector of contact (O’L’ in Fig. 20), making frequency attunement to fluctuation.

B – Attention to novelty. We already showed that attention might be depicted as a constituent of self-structure (Fig. 19). Therefore, attention is connected immediately to one of three main characteristics of an oscillating self-system. A change of direction in attention entails an immediate change of direction in the spatial activity of the self.
Fig. 25. Bifurcations sequence of self-sustained oscillation system with lawful Gestalt-phase change.

Since attention is a part of the **self-structure**, or of the **radial psychological force**, what the phase shift do is to actualize not only the **axial vector of attention** ([O’M’] in Fig. 20), but also the actual self-structure in general or, in a vector form, a common **radial psychological force** ([O’M’] in Fig. 20). Psychologically this means that a disturbance (fluctuation) urges the self to find out a mode for assimilating and integrating the novelty. In Gestalt language, the self is searching for Personality – **actual self-structure** – appropriate for that novelty (Ginger & Ginger 1999, 121). For instance, at school a child becomes a student (a personality of student) more often than he or she does out of school. At home, the child often becomes a son or a daughter, and seldom a schoolchild. S/he easily finds out the appropriate situational self-structure (the personality; the amplitude) or, in vector form, the radial psychological force.

**The amplitude** of the oscillator is a specific version of the self-structure (of the dissipative structure of self) fit for specific fluctuation. This is a **spatial-structural attunement to fluctuation**.

At A & B phases, witness reference frame mostly oscillates inside the self-boundaries.

**C – Awareness of novelty** is possible after psychological forces are activated.

The self-structure (Personality-function; in the model of oscillator – the amplitude, or in vector form – the radial force) is activated while responding to novelty (disturbance, fluctuation). This helps to concentrate attention inside the self, on the specific mode of reply of the self to novelty. Thereby, attention registers a concrete facet of the self; the personality appropriately dealing with the novel situation or disturbance. Attuning attention inside the self to actual
activated self-structure – the chosen mode of the self to deal with the situation – is awareness of personality.

The self-experience (Id-function; in the model of oscillator – the frequency, or in vector form – the tangential force) is activated as a response to novelty, giving energy to the self-structure for a response to disturbance. It can be manifested as feeling, sensation or psychic state change. If attention registers actual experience, and focuses on it, the metasystem of the self attunes attention to the experience.

The performances of the attunement of self-frequency, and of self-structure to disturbance, thereby, are the organization of awareness growth. Rising awareness results in the coherence between disturbance and the self-system at their first contact, which is called the appearance of a figure. This is an “as if” identification of the metasystem of the self, a conversion of sensation and attention to the first current intention towards the point attractor. Excitement and self-energy growth follow from successful attunement to disturbance and recognition of its meaning for the self.

D – Making a choice to be involved totally in the novel event is an acceptance of its contextual meaning for the self-system as a whole. This is the moment of activity of the metasystem of the self (“The I”), often with anxiety – a manifestation of the instability of the self. Motivation to accept (“to be with”) or to reject (“to be without”) something, tried by “as if” identification, is a holistic, even existential motivation. The choice to be with the disturbance-figure means to be sufficiently connected to it by all of the psychological forces of the self as of the whole. Therefore, this is a moment of high responsibility for self-change through the influence of a disturbance-figure. Witness reference frames oscillate organizing the performance of identifications between a new situation and the metasystem of the self.

A choice “to be with” a figure entails a holistic self-attunement to that figure. This choice keeps previous attunements uninterrupted, and produces a coherence of all psychological forces at that moment. This results in a qualitative change and appearance of intention between the self-center and a figure, starting the oscillating tension system in phase space.

A choice “to be without” a disturbance-figure means attunement to instability, to anxiety. Denial of the novel event in detunement with a figure could be an aware avoidance of having to accept the new contextual meaning of the disturbance-figure or situation. However, it also brings with it a failure of previously developing tension systems, and an absence of further oscillations.
E – Scanning the field of psychological forces inside the newborn tension system is a search of a new mode of executing a contact with need or goal. Attention and self-structure are, in general, active in the environment and actualize another direction for the amplitude of oscillator, or for the radial psychological force. Current intention, including its frequency (self-energy) and amplitude (self-structure) constituents, tend to expand to the environment to gain tools for developing a meaningful goal or need. For this, the self-system uses attunement tools; axial vectors of attention ([O´M´] in Fig. 26 A&B) and contact ([O´L´] in Fig. 26 A&B). They are directed along OZ-axis and oscillate in common with the witness’s reference frame, and develop the trajectory of a limit cycle attractor (see also Fig. 17 and Fig. 18).

Fig. 26. Psychological forces between phases D and G.

F – Trials of new modes of action, and the unlearning of old ones – a limit cycle attractors’ periodic oscillation development; activity transfers from axial vectors to vectors of tangential psychological force [O´L´´] and vectors of radial psychological force [O´M´´] (Fig. 26 A). It means that the self proceeds to use axial psychological forces – attention and contact efforts – to investigate the environment. A witness reference frame oscillates between the self-structure and environmental objects.
G – *Attunement in action* and creative adjustment to new situation. This means that the self defined the scale of expansion to the environment in order to fulfill a need or goal. Two psychological vector-forces – tangential and radial – execute the most active attunement work. Axial vectors are subordinated to work towards mastering the situation. Witness reference frames oscillate between the self-center and the activities of the self-structure.

Awareness turns from attuning attention for contact to organizing energy in action and maintaining the efficacy of ongoing activities. Coherence between four vector forces begins a steady psychological state of total involvement into the new activity, and the next phase begins.

H – *Involvement in relationships* with a meaningful need or goal in the field of psychological forces of highest intensity; holistic, or multi-frequency *flow* of new action. It goes in *resonance* of self-structure and self-experience with intention under the influence of torus attractor’s dynamics. All the psychological forces – radial, tangential and axial – obtain their own frequency intertwined with other frequencies in quite a strong field of psychological forces, expressed by the torus (braid) attractor’s shape. The self-sustained oscillation system of the self develops the closest relationships with the environment. Self-structure (personality function, the amplitude) becomes a pure dissipative structure at work in its *intensive lawful restructuring*.

A witness reference frame is always inside of a relationship’s flow.

I – *Withdrawal from contact* with the environment and *assimilation* of results of a new relationships in action; a new order in the individual dissipative structure is in vicinity with restructuring an old self-boundary, which goes under the influence of strange (chaotic) attractor. Vectors of psychological forces show a common activity in circulation between the environment and the inside-self domain. The integration of novelty may be followed by several trials of new comprehension and several withdrawals back inside the self.

This phase is a manifestation of the work of integration, when psychological forces are directed inside the self regardless of the witness position – be it inside or outside the self.
3.10.2 The relationships between the selves in the environment

Large-scale interactive phases of relationships between different people are the following:

Phase A – Sensation
Phase B – Mutual Awareness
Phase C – Negotiations on shared sense
Phase D – Arising of shared sense and a joint oscillating system
Phase E – Negotiations on joint activity
Phase F – Cooperative activity trials
Phase G – Energy / action growth in cooperative activity
Phase H – Flow of relationships
Phase I – Withdrawal from joint activity

We present them using vector notations and schematic diagrams, and interpret them psychologically.

Phase A – The sensation of the single organism-in-the-environment is a necessary condition of each contact. Its attunement to the new environment begins with instability and often demands some efforts of the self to attune to it and to pay attention. In vector form, this means attunement by axial psychological forces. Further efforts of scanning and recognizing new features of the situation – orientation and exploratory behavior – start trials of the environment by oscillating the selves’ general psychological forces (tangential and radial). Psychologically, this means the rising of experience intensity in structural connections between the self and environment.

When the self is not alone, and there is another self in life space, the other could cause a fluctuation in the one-self. But the influence of this fluctuation is different from influences of environmental objects. Relationships between people change the participants more deeply. Therefore, the metasystem and oscillating system of the self has a higher complexity and intensity.

Reorientation and the focusing attention to the other or, in vector form, the activation of axial psychological forces (the axial vector of attention and the axial vector of contact), starts the relationships. The metasystemic functions of
reorientation and focusing of attention demand higher awareness skills than is required in human-environment contacts.

**Fig. 27. Phases before the appearance of point attractor – finding out a sufficient novelty in one-self (A1), in other (A2); following mutual attunement and mutual awareness (phase B).**

Sensation of the other, perceiving him/her, develops into paying attention to other, followed by intensive meaning making in the context. This redirects attention from oneself (A1 in Fig. 27) to the other (A2 in Fig. 27), actualizing the metasystemic functions of the self. The other becomes a source of sufficient novelty in between the selves’ field of relationships.

**Phase B – Mutual awareness.** Exercising attention and skills of mutual exploration, as well as restraining comments and interpretations, allows participants to implement relationships at this phase. However, if comments and interpretations are not held in, this phase will be problematic. The cognitive illusion of the “well known” in the other, or core beliefs about the other will isolate the self from real influences, and will make it unable to develop the relationship.

Increasing relatedness and attunement (Stern 2003, *Introduction*), and exploring the novelty of others, are possible by deliberately mastering the ability to see and to hear of the other as of a whole self. In addition, each self needs to make unusual additional efforts to take care of being seen and being heard by the other (Zinker 1994, 66–67). Respect and unconditional acceptance of the other, a condition of sympathy (Perls 1973) and empathy (Rogers 1961), are modes of experiential mutual attunement in helping relationships.

In vector psychology language, to see and to hear the other, and to feel empathy or sympathy, is to attune the self-frequency of the axial vector of contact to the same frequency of the other, and to follow by an axial vector of the
attention of the partners’ ongoing phenomena. Thereby, a mutual attunement (Stern ibid.) of relationships between participants in that phase may manifest affect attunement (ibid 138–145). It is the attunement between the axial vectors of contact – [O1’L1’] and [O2’L2’] (Fig. 28) of participants.

![Diagram](image)

**Fig. 28.** Nonlinear oscillators with detune phases allowing mutual synchronization.

Awareness of presence levels (Bugental 1987; Lebedeva & Ivanova 2004) – both of one-self as of the other – could also be described by following the axial vectors of attention, and attuning to the axial vectors of contact in a wide range of frequencies.

Mutual attunement in the phase space is shown by an easy phase shift (curved arrow in Fig. 28). It realizes a shift, attuning oscillators to the common phase. If they oscillate by close frequencies, they will be in synchrony.

The axial vector of attention shows attention reorientation in mutual attunement. The mutual attunement of two attention vectors [O1’M1’] and [O2’M2’] is shown in Fig. 29.

Further depiction of interactive contact in vector form will be much more complex, and remains beyond the scope of this research. If necessary, we will use schematic diagrams.
Mutual attunement at the awareness phase (B) depicted by the axial vectors’ shifts manifests the “as if” identification of participants to one another at the very beginning of relationships. We have to analyze the nuances of attunement in order to understand the holistic identification in relationships between people.

Resonance and synchronization are often used in psychological descriptions of psychological adjustment (Csikszentmihalyi 1991, 1993), for instance, of mutual attunement and coordination between individuals (Fogel 1993; Fogel et al. 2006; Wheeler 2000; Zinker 1994). Both phenomena are related to rhythm; i.e. periods or frequencies, of oscillating systems. However, there are differences between resonance and synchronization. More precisely, there are differences in the connectedness of related systems, having many psychological analogies.

Earlier we found that a sudden change in the system is possible when all vector forces are in coherence, or when they have equal phases and frequencies (Pikovsky 2003, 18–20). The same factors are important in relationships between people. The resonances happen, however, in systems with unique energy sources and, thereby, integral frequencies. The constituents of the system are in strong coupling, which makes the oscillations of separate constituents impossible. The tension system, created between the single self and the environment, resonates in each qualitative change. In relationships between people, a weak coupling connects the systems, and they remain the same while being separated from one another. Coherence between different psychological forces of different systems manifests synchronization, even if they create a common system.
In Figures 28 and 29, we considered the synchronization between two people. But in Fig. 26 “B” we showed resonance. The horizontal section of a heavy line (Fig. 30) shows the limits of attunement. A difference between the frequencies of oscillators, or between the experiences of relating people, and which allows the attunement and further mutual coordination of activities, is not large ([KL] in Fig. 30). Beyond these limits attunement is impossible.

Human-environment relationships, also called the intra-psychic cycle, first change the awareness of a meaningful figure. This awareness increases self-energy and results in intention as the basis of a tension system. Inter-systemic relationships create a more complex system. Its further dynamics are possible because of the developing mutual attunement of participants, starting with a mutual awareness inside the interactive system as a whole.

How does mutual awareness start?

Fig. 31. Mutual investigation and attunement of participants to one another (phase B).
First, the synchronization of the participants’ experiences creates a common experiential domain in current relationships. This phenomenon Zinker (1994) called a common ground (Fig. 31). Awareness of the attunement between self-systems creates several common grounds:

- **Affective common ground** (the frequency match field, or the common frequency), synchronizing self-experiences (Fig. 28), manifested in feelings of coherence or commonality.
- **Affective complementarities** – comprehension of the differences in sensations and feelings of partners and keeping awareness of self-experiences (the frequency of self).
- **Common cognitive ground** – synchronizing self-structures (Fig. 29), resulting in a structural-cognitive common ground (the common amplitude).
- **Cognitive complementarities** – the recognition and acceptance of differences of another personality and keeping awareness of structural self-identity (the amplitude of self).

Being aware of experiential and structural commonalities between participants builds strong connections of common ground in the system of new relationships. It manifests itself through the strong experience of coherence. This demands good awareness and organization skills from the teacher or helper. But if it is done, comprehension of partners’ differences results in excitement by the novelty of the other and self-energy growth in each participant. The organization of awareness of the other for all participants results in the synchronization of excitement by the other energies (the frequencies) into common mutual excitement. It nourishes a complex phenomenon of mutual awareness. Therefore, differences between participants (Fig. 31) could become a figure (Zinker 1994).

In nonlinear thinking, this phase establishes a between-selves relational dissipative structure, a field of psychological forces in relationships.

**Phase C – negotiations** of roles, positions, interests, and needs. Common ground and the growing energy of mutual awareness makes this phase possible, while owing to the successful beginning of mutual attunement. This phase manifests the creation of the sound holism of attunement and agreements that synchronize different selves. Only then can mutual attunement and mutual awareness last for the whole period of the relationships unit. This phase changes various notions of Perls of the egotic (isolated, self-sufficient) human being, and shows how each human is implicitly connected to others (Buber 2000; Frank 1990; Wheeler 2000; Zinker 1994).
Phase B is important in building up the common systems’ energies – the frequencies of common system going to be born. This phase is cognitively saturated. Therefore, it is necessary to organize the participants’ coordinated negotiations by building up the common complex personality, or the common amplitude of common oscillator. The most important part of the common amplitude is the common axial vector of attention. Coupled with the axial vector of contact, it focuses the attention of participants on each other. This metasystemic process clears a shared sense at the end of negotiations.

Participants move from building a common ground of different systems to feeling it. An investigation of joint history occurs spontaneously, makes better connections, and helps to make well-grounded decisions on roles or positions allowing mutuality. Intertwined histories and experiences of partners or of group or family members produce shared narratives, extending relationships to psychological and socio-cultural fields. Roles or positions compose a shared history of participants, magnifying mutual receptivity to the partners’ inner worlds (Wheeler 2000). The development of the personality aspects of a system allow it to maintain more easily the emotional expressions, facilitating common experiences and decisions.

This phase gives birth to the mutual coordination of roles or positions in different presence levels, but the individual remains self-sustained. The dynamical balance between a shared sense on common plans and the chosen individual position allows for the acceptance of the current event, being with it, being synchronized. This results in qualitative shift in the common flow of relationships.

Weak negotiations do not take into account personal differences. They entail a superficial presence and a confluence, and interlacing of experiences and structures of different selves before the creation of shared sense. They result in lowering the energy of mutual awareness.

Rejecting commonalities leads to losing a common field of psychological forces and psychological contact stops.

Phase D – The rising of a shared sense and the arising of a joint oscillating system. There are no external observers in a common nonlinear oscillator. Participants of these relationships are implicit constituents of experience-, shared sense-, and a mutual awareness-based whole. The common Personality of the common oscillation system corresponds to the common amplitude. The common system is responsible for mutual influences and the results of relationships (Svirskiy 2001).
Making a choice on the shared sense of and in negotiations organizes all the psychological forces – the common frequency (common Id-function) and the common amplitude (common Personality-function) – into a common oscillation system.

Common psychological forces – radial, tangential, and axial – will be pairwise-matched and co-directional (see 3.8.2), when mutual awareness at phases B and C are greater. When the intentions of different individuals become coherent (at the end of phase C), they produce a synchronization, and manifest a generalized current intention. Dynamics in the phase space coincide with the dynamics of the current intention in human-environment relationships. Point attractors (phase D) and directions of mutual awareness growth create the common tension system. Coherent individual intentions at phase D arrange the joint intention of the common oscillating tension system.

Group synchronization based on mutual awareness and a shared sense creates a joint tension system and a joint nonlinear oscillator. In that phase, participants have the possibility to act together, to cooperate effectively.

Organizing mutual awareness and mutual excitement in order to elaborate a shared sense in the joint oscillation system of selves has the following phases:

- Phase B provides the joint system with a “frequency match” and produces the joint system’s Id-function, the joint frequency vector, and tangential psychological force.
- Phase C provides the joint system with the content of the Personality-function, attuned commonalities, and awareness of differences; it creates the joint amplitude vector, a joint radial psychological force, and makes possible metasystemic attention by means of shared sense elaboration.
- Phase D – shared sense and the joint intention create a joint tension system. This latter system integrates the former into a joint oscillating system, situating them in a dissipative structure of the common life space (or phase space). This new structure – a field of psychological forces – conducts the energy of action to fulfill the joint intention into a meaningfully good Gestalt of shared sense.

Exertion between the current state of a newborn joint system at phase D and a good Gestalt of shared sense is similar to the tension system of relationships between the human and the environment. They both create the effect of “unfinished business” (Zeigarnik effect), and organize a sequence of the systems’ qualitative changes.
Phase E – Negotiations on the joint activity. Negotiations on joint activity possibilities aim at the mutual coordination of individual psychological forces with a shared sense in context. For instance, participants attune with the personal intentions of shared sense and the joint intention. This requires an awareness of our own planned activities and personal attitudes, and requires us to share them with others. Their skills organize feedback and accept the proposals of others who will help to elaborate this phase. The intention to accomplish a shared sense is one of the strongest metasystemic tools, underlying the foreground of relationships. Partners search for their own positions and actions and negotiate them with others. It is necessary to combine personal abilities with the abilities of others, while keeping oneself in developing joint activity.

Fig. 32. Phases sequence creating a joint tension system capable of functioning.

This phase is a good test of basic mutuality manifestations – of mutual attunement, hearing, and seeing the other and mutual awareness at phases before phase D. Good attunement skills will help to understand one another in negotiations. Low skills decrease the energy (the joint frequency) of relationships, and may interrupt negotiations. Additional interventions of helper/teacher are needed to reorganize a mutual awareness returning to phases B-C.

The joint personality of a system (the joint amplitude) and its dynamical self-concept (unfolding common narrative) should be able to realize a shared sense. The personalities of participants tend to realize themselves through an individualized shared sense. For this purpose, they create their positions inside the common narrative of current negotiations.

At that phase (Fig. 32), a clear common image of a joint action (joint Gestalt) is necessary, which is connected a specific actor to a common, expected result (his/her individual Gestalt attuned to common). Shared ideas of subsequent activity are coordinated with the shared sense and with a joint intention.
Negotiations on possible relational actions are often intertwined with action trials. In other words, phases E and F often alternate.

Phase F – Cooperative activity trials are active attunement, manifesting previously mastered mutual attunements in action. It is necessary to synchronize the participant’s individual intentions. Synchronization focuses on ongoing activity trials. Balance between an individual activity mode and integrity of joint action is tested, and it often needs a helper’s / teacher’s support. If some activity trials fail, it is necessary to return them to a previous phase. A successful current phase indicates the structural maturity of a system, and its ability to take responsibility for its actions in the current field, in accordance with the joint intention. Response-ability in action shows an adequate level of current mutual awareness, and also a correspondence of activity energy expressions (Id-function; the joint frequency) to actual structure (Personality-function; the joint amplitude). The metasystemic psychological forces of participants – axial vectors of attention and contact – alternate the focused attention directions between shared sense and activity trials. The witness reference frames of each participant realize identification/alienation functions at phases E and F many times, oscillating between the personalities of one-self and the other.

Phases E, F and G have a common peculiarity of steady exercising and development of mutuality. An increasing synchrony of actions, such as mutual understanding and joy in activity trials, points to the necessity of the next phase.

Phase G – Energy/action growth in cooperative activity. The rising of a joint system’s energy (a joint system’s frequency) in cooperative activity at limit cycle attractor is a reliable sign of its developed mutuality. If we follow the development of a human system to this point, we notice, that:

- cooperation is finally established on a common ground,
- roles are distributed and connected in a system’s current narrative with shared sense in context,
- attunement is performed constantly between different vector-forces – both individual and common,
- the joint system’s energy grows.

The previous phase’s lawful development made a careful preparation of joint system’s integrity. Now it is a properly organized and self-aware system of relationships maintaining its mutuality. It demonstrates a growing performance potential, and, in common with phase F, manifests a version of the stable state of an oscillating system, one subordinated to a periodic attractor.
The psychological forces of all participants show the highest synchronicity at this phase. They are at the main point of their relationships – at the starting point of total involvement in relationships with a shared sense. The attention of each participant is focused on its relationships with the other. Witness reference frames regularly oscillate between one-self and the other. Participants are involved in a relationship’s positions (roles, personalities), and attuned to the other’s positions in common narrative (joint personality manifestation).

**Fig. 33.** The joint tension system developed until maximum of periodic attractor – a limit cycle.

The intentions of all participants coincide with the joint intention of a joint oscillating system (Fig. 33). In nonlinear thinking, the system has a high complexity, where an energy source (the synchronicity of participants’ frequencies/energies) supplies more energy than the periodically oscillating system can assimilate. Thus, the **instability** of the periodic attractor appears.

Nevertheless, an oscillating system cannot lose all the complexity and energy it has stored up. The contradiction between the mutual attunement of joint systems constituents and the sudden growth of a joint system’s energy is hidden in the growing magnitude of mutual attunement work, or in the growth of mutual awareness.

A system without an external observer synchronizes its relationships’ functional components itself, focusing on their mutuality, rushing towards the joint intention and shared sense. In a high-energy state, mutual awareness is connected to self-awareness, and joint intention is connected to individual ones. Therefore, the system complicates all of its characteristics – the joint frequency, the joint amplitude and the phase magnitudes. In the sudden change of the joint system, the joint system’s constituents – relationships participants – also change.

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Phase H – The flow of relationships describes the total involvement in a joint activity, the most intensive relationships that realize a shared sense.

![Fig. 34. Well-developed structure of interpersonal relationships – intertwined characteristics of the joint oscillating system.](image)

Energy gathered by the system in previous phases is in coordinated flow with the joint frequency, the joint amplitude, and the phase shift. This happens with each participant’s same characteristics, but to a different extent.

This is the best place to see the dissipative structure of multidimensional interpersonal relationships, shown by the graphic image of a torus attractor (Fig. 34). Boundaries between system and environment, but mostly between the participants of a system, are in maximum flexibility. Energy circulation between structural components can be easily changed in ways coinciding with joint intention and shared sense. Transcending the joint oscillation system beyond its boundaries reconstructs it in the common, involving all of the participants’ relationships.

In the joint intention, the goal of relationships and the actual relationships coincide. The connection between a past state of the system (tension system birth) and the future state of the system (the attractor) happens at that moment.

Participants of the joint system fall into the highest possible mutuality and mutual change. They stay at that process until the common energy of the system is totally directed and consumed to the fulfillment of a shared sense.
This state of relationships is a relationships flow in the sense of Csikszentmihalyi (1991), but not only in human-environment coping strategies. This is a self-organized, joint, self-sustained oscillation system of interpersonal relationships in their extreme lawful change.

Phase shifts, immediately connected to the metasystemic attention concentration, show the highest activity among oscillating constituents, setting the fashion of ongoing oscillations, and outlining the whole of the torus attractor (Fig. 34). It means that the metasystem of the “joint self”, just as the metasystem of the self in human-environment relationships, performs the fulfillment of relationships with sense in context.

**Phase I – Withdrawal from joint activity**, at this phase personal enrichment of results and their assimilation takes place. The fading away of joint activity trajectories with former shared sense shows the decrease in energy beyond-self-boundaries activities. Energy transfers from mutual attunement in relationships in a joint system, to attunement of a relationship’s results to the oscillating self-system, or to assimilation. This is a moment in the growth of the individual’s intrinsic order owing to well-organized relationships.

![Strange (chaotic) attractor of psychological forces in withdrawal from relationships.](image)

System members withdraw from the common ground and shared sense. Narrative is fulfilled and different personalities inverse their structural activities towards themselves, integrating experiences. This integration process towards the self-center becomes hidden for the rest of the former system members and for the external observer.
The rest energy of the former system is directed towards the individual structures and the assimilation of the results of a previous phase. Self-resonance occurs in both function’s activities, spending more and more energy for integration purposes around the motivation-integration center (metasystem of the self).

This situation is schematically shown in the strange (chaotic) attractor’s configuration: the previous attractor bifurcates into many connected trajectories; some are for the previous relationship’s completion, and others – for the inside-self work of integration (Fig. 35).

If the energy of the oscillating system of the individual self is enough for trials of new activity, they could happen even at this phase. Then, former participants make new contact trials with former partners using new knowledge.

Finally, all the phases of relationships naturally intertwine with one another. One can register features of each phase in another phase’s flow. In established relationship flows, the main phases of relationships are alternations of subordinate small-scale (fine) phases. Aware relationships manifest themselves by depicting lawful qualitative changes, expressing the whole unit of relationships, or even a part of it.

3.11 The dynamical system: important theoretical details for data analyses

In paragraph 3.9.3., and later on pictures of vector forces are presented. For the convenience of reading, we simplified many of them. While describing vector forces having influence on the phase point, we did not depict two main oscillators’ characteristics – the radius-vector of phase point and the phase of oscillation. We also use the vector of intention and current intention in place of strict “generalized vector of intention” and “momentary vector of intention”. We used generalized vector of amplitude oscillations in place of strict “momentary generalized vector-force of amplitude oscillations” and the vector-force of rhythmic rotation in place of “momentary generalized vector-force of rhythmic rotation” (Fig. 19; see also Fig. 38).

The phase point (O’ in Fig. 36; O’’ & O’’’ in Fig. 37) represents the current phase state in phase diagram, unfolded into phase space event. In this study, phase diagram shows the dynamics of the self-environment (selves in environment) system, explained by the subtle bifurcations sequence (Abraham 1990).
Psychologically, phase point corresponds to the momentary psychological state of self-environment (selves in environment) dynamical system.

Fig. 36. Vector sum of all psychological forces having influences on phase point O', gives the momentary vector of intention [O'I] (see also Figure 22).

According to the methodology of “new holism” and the general understanding of real nonlinear dynamical systems in nonlinear environment (Knyazeva &
Kurdyumov (1992), the phase point manifests the momentary phase state of the system, but not only the state of self apart from the environment. It means that there is no nonlinear psychological state of the individual separated from the current nonlinear environment.

The self-environment connectedness is similar to the connections offered by the “organism-environment” theory of T. Järvilehto. In this theory, “human learning is a process exceeding the borders of the individual organism-environment systems. It is this larger organization in which the human learning is realized, and therefore all efficient learning presupposes the participation of both the teacher and the pupil” (Järvilehto 2006). There are many possible connection configurations in self-environment (selves-in-environment) relationships. In this research, they are illustrated with a few possible nonlinear dynamical system versions, the “Benard cells” begin one of them (Fig. 38).

![Fig. 38](image.png)

Subtle bifurcation sequence describes another open dynamical system (Fig. 16). We suppose that nonlinear oscillator as dynamical system passes through these bifurcations. Let’s examine the main vector-forces influencing the phase point (or momentary psychological state) in phase space, starting from the self-system.
3.11.1 The constituents of the vector of momentary intention for self-environment system

The vector-force of momentary intention \([O'\ I]\) connects the metasystem of self with the need or goal in the environment making sense for the individual. The energy of self is consumed in two psychological functions (forces by Lewin):

- In continuous supply with energy the processes of boundary structuring-restructuring and experience integration (Personality-function); this coincides with the system’s dissipative structure functioning as it is \((O'M)\) in Fig. 36 and \((O''M)\) in Fig. 37). This part of the energy arranges the structure of the tension system, maintaining the construction of the relationships energy conductor. In the analogy of breathing function, this is the energy and substance for arrangement and maintenance of the lungs.

- In energy (and substance) flow through the boundary structure between the self and the environment; this provides the work of relationships flow (Id-function) \((O'L)\) in Fig. 36 A & B; \([O'L]\) and \([O''L]\) in Fig. 37). This part of the energy is conducted through the structure of the tension system. In the analogy of breathing function, this is the air passing through the lungs.

Work is required in looking for the need (goal, sense), and fulfilling it. This work spends energy from inner sources and this in turn changes the phase points’ state, or the psychological state of self, and changes the radius-vectors magnitude \((OO')\) in Fig. 36; \([OO']\) & \([O2O''']\) in Fig. 37) of the phase point \((O'\) in Fig. 36 & O’, O’’ & O’’’ in Fig. 37) in the phase space. Spending energy on structuring-restructuring of the system and maintaining its self-integrity is shown by vector \([O'M]\) in Fig. 36, and \([O'M]\) & \([O''M]\) in Fig. 37. Spending energy to reach the sense of work, need or aim is depicted by vector \([O'L]\) in Fig. 36, and \([O'L]\) & \([O''L]\) in Fig. 37.

The self-structure in relationships and the relationship flow through the structure should correspond to each other. In breathing system analogy, the lungs’ structure should correspond to the used air we are expiring – its content, temperature and pressure, and to the work the organism is performing. It is better to breath the air in atmospheric pressure and at “normal” temperature. Fresh air could be a poison for sick lungs, and rarefied air will be dangerous for healthy lungs. Therefore, the air flowing through the lungs and lungs structure should be compatible, especially when we need to vary the air conditions or/and lungs functioning intensity. The same compatibility should be between the
psychosomatic functions of Id and Personality. To put it simply, the energy used by the self in contact with the environment in some purpose, should flow though the self-structure (including self-boundary) as proper to the task of actual relationships. These functions adjust to one another by the task (need, goal, sense).

For the steady-state structure of nonlinear dynamical system (say, oscillator), there is a law of mutual accordance between energy dissipation (making and/or maintaining the structure) and energy use (Fig. 39). In nonlinear systems language, if there is more dissipated energy than needed (dark curve upwards to point A’), the dissipative structure will not obtain enough energy inflow (light curve to the right from point A’). As a result, the system will fade back to point A’.

If the energy flow through the system’s boundary is more than the self-structure’s (and/or self-boundaries’) conductivity (light curve, the point A’+), the system will be ineffective. The energy inflow will be lost, and the system fades to point A’ again, if not destroyed. This is the case of disturbance with growing amplitude (A+), which results in the restoration of the amplitude (see also Fig. 15 in 3.8.1).

But if disturbance diminishes the amplitude (A-), then the energy inflow (A’-) will be bigger than energy dissipation (A’-’), so the system will restore the amplitude again to value A (point of curves intersection A’).

Therefore, for stationary oscillations of the nonlinear dynamical system with amplitude A, after the removal of disturbance – with increasing or decreasing the amplitude, – the amplitude will be restored. This happens around the point of intersection of two curves – energy dissipation for dissipative structure maintaining, and energy inflow to perform energy flow through the dissipative structure.

The law of amplitude restoration (Fig. 39) is depicted in scalar (non-vector) form, and explains the “Zeigarnik effect” from the energy/structure side. Giving a new task to a student by interrupting the old one corresponds to lowering the energy inflow to the previous task. But it has the steady-state dynamical tension system, so it has the interrupted amplitude. After the removal of “new task” interruption, coming back to the previous task is restoring the amplitude of oscillations of the “student-task” dynamical system.

The “amplitude” (A in Fig. 39) characterizes the current process of relationships, but the law of correspondence of energy inflow and dissipation provides the conditions for these oscillations. It regulates the distribution of the energy between supporting the structure of a system, which makes it possible for the relationship to flow through it. In the lungs analogy, the energy is distributed between supporting the lungs structure as it is and breathing through the lungs.
Fig. 39. Two counteractive factors – dissipation and consumption of energy from the source – define the amplitude of stationary oscillations (see also Pikovsky et al. 2003, 60: Fig. 2.8).

The amplitude as it is (Fig. 39) has the value of a radius-vector (OO’’ in Fig. 36 & Fig. 37). The radius-vector’s absolute magnitude changes lawfully as the bifurcation sequence unfolds. But structuring-restructuring the system is more complex, and includes many structural transformations. Therefore, the totality of amplitude (radius-vector) wave-like changes, or continuous structuring-restructuring of Personality-function is named “amplitude oscillations”. This is a generalized denotation for continuous energy dissipation expending to arrange the structure of the dynamical system.

Strictly speaking, there are a few types of amplitude’s lawful changes (of radius-vector’s magnitude): the macroscopic change described by bifurcation sequences, and microscopic structuring-restructuring of the system, denoted by “amplitude oscillations”. The microscopic transformations are connected to relationships work immediately. The amplitude manifests macroscopic mode of relationships, running mostly inside self-boundaries (phases A-D in Fig. 40), mostly outside them (phases D-G), mostly on the boundary (phase H), or combined inside-outside relationships (phase I in Fig. 40). For different phases, the microscopic amplitude oscillations are very specific for each phase. Because of that, lawful connections between energy dissipation and energy inflow should also be different. However, this goes beyond the tasks of our research.
Fig. 40. Bifurcations sequence of self-sustained oscillation system with lawful Gestalt-phase change (see also Fig. 16, Fig. 23 & Fig. 25).

Thus, the energy spent for connectedness between the self and the environment is the energy to arrange a dissipative structure between the self and the environment. It is a condition for the structural adjustment of the self to the specific environment, and is performed by dissipated energy (dark curve in Fig. 39). The energy part, spent for relationships through that connection, through specific dissipative structure, is the energy inflow (light curve in Fig. 39).

Thereby, the adjustment of the person to the current environment in order to perform the task (sense, goal, need), if we use nonlinear system models, is regulated by the lawful relations between dissipation and consumption of energies (Fig. 39). The same stands for role play, if the role is one.

Let’s analyze a part of the example from paragraph 1.4. (see Table 1).
Table 1. Analyses of vector constituents of self-environment system.

<table>
<thead>
<tr>
<th>Example (see 1.4, fore-contact phase)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 3-year-old girl playing in a sandbox in the kindergarten playground gets an uncertain feeling,</td>
<td>This is the appearance of inner disturbance. It manifesting a necessity of something. The amplitude of the nonlinear oscillator of the system “girl-playground” changed. This may correspond to point A in Fig. 40 with lower energy inflow (A`) and lower energy dissipation (A``).</td>
</tr>
<tr>
<td>manifesting a necessity of something. She begins to turn her gaze around, searching for something</td>
<td></td>
</tr>
<tr>
<td>or somebody meaningful for her. She sees two boys clashing, a girl playing with a puppet, a tutor,...</td>
<td>This is attunement to the environment (phases A &amp; B in Fig. 40), and search for the necessary conditions to fulfill the appeared sense, need or goal. This corresponds to structural attunement to the environment (by vector [O'M] in Fig. 36 or by [O''M] &amp; [O'''M] in Fig. 37). It is followed by more energy dissipation and moving A``- towards A` (Fig. 39).</td>
</tr>
<tr>
<td>... and she suddenly feels excitement seeing a shovel. Her face brightens up, she smiles, leaves</td>
<td>This is the end of structural attunement to the figure (sense-making goal, need) (phases C &amp; D in Fig. 40). Excitement manifests affective attunement to the figure – shovel-in-sand (by vector [O'L] in Fig. 36 &amp; Fig. 37, and [O''''L] in Fig. 37). It corresponds to move of A<code>- towards A</code> in Fig. 39.</td>
</tr>
<tr>
<td>over the sandbox and runs towards a shovel not far off. Thereby, playing with the shovel in sand is</td>
<td>This means that amplitude A, in its turn, makes a lawful change and moves from phase A to phase D (Fig. 40), attuning to a figure (appeared sense-making goal or need). These two attunements result in the appearance of intention [O'I] (Fig. 36) and of the tension system. It is not depicted by the plane diagram in Fig. 39.</td>
</tr>
<tr>
<td>her figure.</td>
<td></td>
</tr>
</tbody>
</table>

3.11.2 The constituents of the vector of momentary joint intention in the system of man–man relationships

In man-man relationships, the vector-force of momentary intention [O'I] connects the metasystem of selves with the need or goal in the environment making sense for the individuals. To reveal the joint intention, the energy of the joint system is consumed in two psychological functions (forces by Lewin):

In continuous supply with energy of the joint dissipative structure, or the mutual connectedness (and self-boundaries), structuring-restructuring and experience integration (Personality-function) in joint system. This corresponds to
the energy dissipation (Fig. 40) for the joint system’s dissipative structure ([O’M] in Fig. 36 and [O”M] in Fig. 38). This energy type creates and maintains the structure of a joint tension system, and performs the role of mutual relationship’s energy conductor. In the analogy of breathing function, this is the work of the coordination of lungs, for instance, with the blood circulatory system, and in general, with the rest of the psychosomatic organism.

In energy (and substance) flow through the boundary structure between selves in the environment; this provides the work of relationship’s flow (Id-function) from the very beginning of mutual contact in couple or/and group (see paragraph 3.10.2). In vector form, it corresponds to vector [O’L] in Fig. 36 A & B, and to [O’L] & [O”L] in Fig. 37. This energy performs the work running through the joint system’s structure. Therefore, it is spread between the individual and the joint tension system. In the analogy of breathing function, it covers more than the breathing process. It includes the coordinated activity of the air passing through the lungs and the circulating blood, and the nervous system’s signals, and all other energy-substance circulation, activating the psychosomatic organism as a joint system towards the common goal (need).

To illustrate this with the relationships between people, it is convenient to use a part of the example of data analyzed in paragraphs 4.1–4.3 of this research.
Table 2. Analyses of vector constituents of interactive system.

<table>
<thead>
<tr>
<th>Example</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noora (No) comes to the sofa with a table-theatre puppet made of paper; a bear (B) is in her hands. She climbs to the sofa, behind Liina and listens and looks at Lotta and Liina. Lotta looks for a while at her puppet, and goes then to the other end of the sofa. Her attention is out of the relationships and out of a previous place of a common play (see Fig. 51-53).</td>
<td>The joint life space of Noora and Liina is going to be arranged (the phase space for vector-field of interaction between Noora and Liina). Noora works for this: she has a bear (B) table-theater puppet. At the moment, Liina has a Red Riding Hood (R2) puppet. By the previous narrative experience of Noora and Liina, these two roles – aggressive (B) and victim (R2) can nearly arrange the version of “Little Red Riding Hood” narrative. Moreover, they have an experience of mutual relationships. These are necessary conditions for a common dissipative structure. It is easy to attune the available puppet roles to one another (work of joint dissipative energy (dark curve in Fig. 39) denoted by vector [O´L] in Fig. 36). It is manifested by Noora’s attention adjustment, and the preliminary compliance of Noora’s and Liina’s puppets to the common narrative. Lotta has a puppet contradictory to the possible joint narrative. She has failed with adjusting the role, and left the common life space (and out of joint sense, creating the joint phase space and psychological forces field).</td>
</tr>
<tr>
<td>Liina’s puppet knocks on the imagined door in front of Noora’s bear. She is changing the topic of a play: Liina: knock, knock, knock, will my son come? (see Fig. 51)</td>
<td>Liina does a work of role adjustment by proposing a “mother” role for a presumptive “son” – a role for Noora. This is still the work of arranging a joint dissipative structure, denoted by [O´L] vector (Fig. 36) or [O”´L] (Fig. 37).</td>
</tr>
<tr>
<td>Noora holds her bear upper against the sofas back (see Fig. 52), and then moves it down to sit. Noora: I am a bear</td>
<td>Liina’s efforts – her investment in the joint dissipative systems’ energy is failed. Noora demonstrates a steady state of individual role (B) – a steady-state individual dissipative structure. She demonstrates twofold behavior: a) she is in contact with Liina, and ready to arrange a joint dissipative system with Liina (Noora’s constituent of vector [O´L]); b) Noora insists on keeping her own role (B) in the joint dissipative system. This allows Liina to create the joint dissipative structure (i.e. connectedness) – to adjust her role (her constituent of the joint [O´L] vector) to Noora’s.</td>
</tr>
</tbody>
</table>
Example Interpretation

…Contact flux between Liina and Noora passes fluently. Liina talks and Noora keeps silent. Noora’s attention and body movements follow Liina’s puppets’ movements and words. Noora agrees with Liina’s initiative, attuning to her (see Fig. 52 and Fig. 54: Noora’s gaze directions). Thus, the first three phases of relationship (A, B, C) go one after other, arranging the two girls’ joint nonlinear dynamical system (see Fig. 53).

Liina uses the chance offered by Noora: she adjusts her own puppet to the bear’s movements. Thereby, Noora and Liina create a joint vector of amplitude oscillations responsible for the joint dissipative structure’s activity, denoted by a joint vector [O’L] (Fig. 36). This makes it possible to use common activity energy, described by joint vector [O´M] (Fig. 36) or [O´´M] (Fig. 37). The girls follow one another in gazes and movements. They are mutually adjusted, and arrange a workable dynamical system.

In Fig. 41, the joint dissipative structure for the joint play of Noora and Liina is schematically depicted (see also Fig. 53 and 54). Strictly speaking, this is a schematically shown basin of point attractor (Fig. 53, phase D; Fig. 40, phase D), a place before attractors revelation. It is a spatial-time condition, structured by an arising joint sense, meant for further coordinated activity.

The role attunement between Liina and Noora is resulting in their common ground arrangement (Liina-Noora system in Fig. 42). This makes it possible to attune self-energies (Fig. 42) and creation of coordinated activity.

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<td>Liina uses the chance offered by Noora: she adjusts her own puppet to the bear’s movements. Thereby, Noora and Liina create a joint vector of amplitude oscillations responsible for the joint dissipative structure’s activity, denoted by a joint vector [O’L] (Fig. 36). This makes it possible to use common activity energy, described by joint vector [O´M] (Fig. 36) or [O´´M] (Fig. 37). The girls follow one another in gazes and movements. They are mutually adjusted, and arrange a workable dynamical system.</td>
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The role attunement between Liina and Noora is resulting in their common ground arrangement (Liina-Noora system in Fig. 42). This makes it possible to attune self-energies (Fig. 42) and creation of coordinated activity.

![Common ground diagram](image)

**Fig. 41.** Mutual investigation and attunement of Liina and Noora to one another (phase B in Fig. 40) (see also Fig. 31) in creating joint dissipative structure for joint system of play.
Now the Liina-and-Noora joint system has a steady-state structure, a common ground (in Gestalt language) for using energy of their joint activity, depicted by vector [O’L] (Fig. 36 & Fig. 37). And two kinds of joint energy – dissipated energy and energy inflow (Fig. 39; phase C for Liina-Noora system in Fig. 42) – are in mutual accordance in the Liina-Noora system. This creates a joint intention ([O’I] in Fig. 36; vector of intention at phase C of the Liina-Noora system in Fig. 42).

It is possible to observe the joint motive of all the three girls’ to play together. For instance, in Fig. 55 and in Fig. 56, Noora and Liina pay attention to Lotta together. This is an indication, that all the girls dissipate much energy (Fig. 39) to create the three-girls’ joint structure. Later on, Lotta makes a lot of trials to adjust her role to the established steady-state of Liina-Noora system: she alternates many objects (see Fig. 56, Fig. 58 & Fig. 59) as offerings of common topic and sense of play. Thereby, Lotta attracts the two-girls system’s attention. Attracting their attention means an urge to create the three-girl systems’ joint dissipative structure. The motive to play together can be realized merely on a real common ground, through a sense-making connectedness of all the three girls.

When Lotta offers the grandma puppet (Gr in Fig. 60 – Fig. 62), she performs energy dissipation in full accordance with the energy dissipation structure in the Liina-Noora’s system. This means the synchronization of vectors of amplitude oscillation in Liina-Noora system with the same vector in Lotta’s system (Fig. 42). The joint play structure becomes suddenly built. The sudden change in the relationship’s rhythm between the three girls, following this event (Fig. 62 – Fig. 66), is a “catastrophic” acceleration, similar to opening the locks on the way of relationships flow. It indicates clearly that a joint dissipative structure appeared suddenly. This structure (“communication”, by Prigogine (1980) and Capra (1996; 2002)) can conduct the coordinated activity energy of all the three girls.

In Fig. 42, phase D happens exactly after the appearance of joint dissipative structure, and after the nonverbal agreement of the girls to play choosing between Red Riding Hood, Bear and Grandma. It is similar to the discovery of the joint structure, or to falling down into the structure suddenly revealed.

Probably, being caught by the version of a joint sense of this play, familiar to all the girls beforehand, shows a creative restructuring of the previous joint sense. This creative leap makes accordance between dissipating and inflowing energy (Fig. 39) possible, and reveals the joint intention of three girls system (vertical black arrow with white edge growing upwards from point attractor in phase D in Fig. 42).
The “tree of joint system” grows by Noora and Liina’s joint efforts of role attunement in common narrative of play. Three-girls system appears by Lotta’s attunement efforts at phase C of Liina-Noora system.

Further “growth of the tree of joint system” (Fig. 42) and of joint intention goes by the logic of subtle bifurcation sequences (Fig. 40; see also paragraph 3.10.2).

The study of relationships interruption, and of disparity between energy dissipation and inflow is a topic of future research.

Summary

As a result of the theoretical analysis in this chapter many central concepts characterizing human relationships are changed, such as the concept of the self, the field of psychological forces, intention (tension system), and affective rhythm.
and self-structure of relationship system, self-boundary dynamics and psychological resistances. These concepts manifest dynamic characteristics previously kept in the background. They disclose new aspects of oscillation dynamics and qualitative shifts.

This is why nonlinear dynamical systems in human relationships and change did not appear suddenly: their necessity had been prepared by the logic of scientific evolution in general. Lewin’s theoretical and experimental research combined with applied knowledge from helping relationships, and some insights of developmental psychology prepared the qualitative change in notions of human relationships. A linear approach to human relationships and the “Aristotelian mode of scientific thought” are the main weakness of previous relationship models and thinking. They are not usable for contemporary demands for organizing human relationships aiming at developmental change. For example, the structural model of contact cycle flow in the Gestalt-therapy or the Benard cells in description of group relationships focus mainly on the nonlinear characteristics of relationship flow. They both use nonlinear features of dynamic systems such as structure, functions and fluctuations.

The complexity of combining different theoretical ideas on nonlinear dynamical systems with Lewin’s and Votsmeier’s theoretical results reveals the challenge of scientific thinking. We have to forget equilibrium as the basis of holistic understanding in the analysis of nonlinearity of the human relationships. Disequilibrium and the dynamic stable state of the system help to understand the boundary between human and the environment in a “new holism” (Knyazeva & Kurdyumov). Relationships are dynamic dissipative structures connecting human and the environment. This helps to change from the classic dynamic presentation of tension system by Lewin & Zeigarnik, restricted by the self-boundary, to the dynamic tension system arranged by intention (or joint intention in man-man relationships). This tension system originates in sense making and actively uses the mobility of witness reference frame (Lewin). A reference frame synthesizes all the dynamic vectors of psychological forces between the metasystem of the self or the group and the need (goal, valence) in the environment. It opens up the classic life space (Lewin) in the dynamics of phase space of nonlinear dynamic systems.

Lewin and Perls proposed models which allow immediate use. The nonlinear dynamical model of relationships elaborated in this research may need an additional step of application. The complexity of relationships and their model corresponds to the complexity of selves and their needs or goals in relationship
flow. The model of relationships present a unified dynamical nonlinear system –
nonlinear oscillator – unfolding as subtle bifurcation sequences. Both units of
analyses contain many details of relationship flow and oscillation, which are
known to Gestalt-practitioners. However, understanding some of the aspects
presupposes good theoretical command of scientific knowledge. Knowledge of
the oscillation system in professional organization of human relationships is one
example. The advantage of this approach, however, is discovering many
important details of professional organization of relationships.

We suppose that our generalized analogous model of nonlinear oscillator as a
relationship system will help to develop relationships professionally. A higher
awareness of contact is emphasized in the model and better results can be attained.
This, however, requires knew knowledge and skills.
4 Nonlinear dynamics of children’s play

Carrying out analysis of children’s play has several advantages. First of all, children have not developed resistances, as adults have. Therefore, there are not many relationship interruptions, something which is inherent to adult deliberate interactions. Secondly, the pretend role-play of preschool age children has all the components of adult activity, even while still developing. Relationships with a shared sense in children’s pretend play can be readily modeled. Thirdly, we have tried to avoid age-specific distinctive features in our analyses. We try to grasp the overall phenomenological character of play relationships as a nonlinear dynamical system.

We analyze empirical data in two ways: first, a general analysis of pretend play is carried out using our nonlinear model, and second, detailed analyses of play episodes are made in the “Table for analyses” (see Appendices).

Empirical data is gathered in the laboratory for creative play at Kajaani campus (University of Oulu, Finland). Bredikyte (2006, 73–74) describes the purposes of the play laboratory: “Our experimental play laboratory serves several purposes: (a) it is a club for young children’s (from zero to six years) creative play; (b) learning site for university students; (c) research laboratory on play, creativity, imagination and learning. Once a week a group of 10 to 15 children attend our club and participate in different activities organized by the university students. Children come together with their parents and stay for 4 hours. Children are offered eight main areas for creative activities”.

The play data used in this chapter forms part of a longer term activity which started with a dramatization of the folk tale “Little Red Riding Hood”. Dramatization is used as a tool for stimulating children’s joint play: “Dramatizing involves children in joint sense creating activity together with adults at a very early age. Drama is a method for building a joint world through conflicts, dialogues, negotiations, explorations, new experiences and sharing. Dramatizations together with adults offer an opportunity not only to observe but to practice ‘acting’ skills as well. We can conclude that story gives shared content to children’s play activity and creates strong motivation”. (Bredikyte 2006, 73)

One such event was recorded during the spontaneous play of children in 2003. The play activity took place between 10 and 12 o’clock in daylight conditions. Children were neither tired nor excited and played in natural light. For ethical purposes, the names of the children have been changed. We call the girls Lotta (6:2), Liina (3:10) and Noora (3:5).
All three girls saw the puppet show “Little Red Riding Hood” on 19th March, 2003, more than a month before their joint play. After the puppet presentation, the puppets visited the children’s homes and they had an opportunity to play with them. The same puppets were used in the children’s own puppet presentation when students asked children to present the story of “Little Red Riding Hood” for the other children visiting the club. Lotta performed the role of Red Riding Hood twice before the date of the pretend play. The girls understood that the original Red Riding Hood is the transformer puppet. The play of Lotta and Liina starts with a quarrel about the authenticity of the puppets. Lotta has the “Little Red riding Hood” transformer puppet in her hand and Liina has a “Flower princess” puppet, which is beautiful, but has a simple stick as feet.

The previous history of the girls’ relationship is as follows. Lotta came to the children’s group in November 2002 and at the time of the play she had known Liina and Noora for about six months. However, she did not have a close relationship or advanced play interaction with them. In contrast, Liina and Noora had known one another for about seven months. They can be called playmates having common play experiences.

Photos of the girls in the analyses are copied from the videotapes.

A common system with current relationship directions (arrows) and valences (“−” as a sign of negative attitude, and “+” as positive attitude) is marked using the model of psychological life space, forces, locomotions and boundaries by Lewin. Each child is denoted by a circle with initials. Puppets and other props are denoted by squares with a brief name of the puppet or prop.

The initial situation

Lotta (Lo) has the transformer puppet, which is Little Red Riding Hood (R1), and Grandmother (Gr). Liina (Li) has a theatre puppet with long red skirt under which there is a stick as feet, and she is using it for her Red Riding Hood (R2). In the beginning, Liina is sitting on a sofa; Lotta is crouching beneath it, busy with her puppet. Liina’s puppet lies on the sofa. The event happens on that sofa.
4.1 Analysis of nonlinear dynamics in pretend play

The play interaction

The girls begin spontaneous talk, Lotta is adjusting Grandma’s clothes (Gr). Liina tries to turn it and to see another side (R1), then tries to catch Lotta’s Grandma (Gr) puppet. Lotta does not give it and pulls it back (see Fig. 43).

Fig. 43. Liina unsuccessfully tries to get Lotta’s puppet.

Lotta transforms her puppet to the side of R1. Liina takes her puppet (R2), looks at it and begins to talk with Lotta. Lotta turns the puppet to another side of Little Red Riding Hood (R1). She begins to move her puppet (R1) towards Liina’s (R2) with growing emotional utterance, apparently reacting to Liina’s catching trial. Lotta replies with the same energy, pulling Liina’s puppet (R1) with her own puppet (R2).

*Lotta: Hi, I am Little Red Riding Hood!*

*Liina: I am Little Red Riding Hood too!*

*Lotta and Liina, simultaneously: me me me me!!!* (see Fig. 44).
Fig. 44. Liina and Lotta compete in spite of listening and investigating one another.

The puppets push each other, girls yell loudly. Girls express themselves to one another with increasing energy. Their accessibility for one another is low. They both express their own selected pretend personalities and defend with growing energy.

Liina: Grandma said that I am Little Red Riding Hood – grandma said that I am Little Red Riding Hood

Lotta: But my grandma said that I am Little Red Riding Hood

Girls are fantasizing about virtual “grandma’s” connected to the assumed topic of play. They stuck to contradictory personal desires in possible common topic of play, and use fantasy to make authoritative statements, attacking one another and persisting in their own ideas. They are not in contact. The girls’ attentions are busy with affectively charged roles and competing fantasies. The self-expression collision prevents them to have and develop mutual perception. Thus, they have no chance to see and to hear one another (necessary at phase A in the model), failing in mutual awareness – a basic condition of relationship flow development.

Liina: Didn’t you know that you are not Red Riding Hood but red man!

Liina says the last words in a whisper, leaning forward and slightly pushing Lotta’s puppet. The last utterance reinforced with nonverbal attacking (spreading of self-boundary to another’s life space without negotiations and agreements) is a projection resistance, which interrupts a contact.

Girls are at the beginning of phase A (see phase diagram at Fig. 45) and experience difficulties with developing their contact further. Projection (Liina’s last utterance) is a usual contact interruption at that phase.
At that moment the adult behind the camera intervenes (Fig. 46):

Liina looks up for a while at the adult, and then turns her gaze away, leaving her puppet on the sofa, which is the common territory of play trial. Lotta looks at her puppet. Silence reigns for a while: the growing conflict is frustrating. Then Liina’s left hand continues moving a puppet on the sofa while still looking away.

*The adult’s intervention* was made with the same expressiveness as girls’, in the style of calling attention and querying. The adult stays with the same topic of the play, but gives hints to broaden the current play event. She keeps the girls’ attention inside their relationships, focusing on their inappropriate role choices.

*The adult’s attitude* towards the play participants is not charged with expectations of “how it should be”. The girls’ freedom of initiatives is accepted. The adult has an equal responsibility in the influence to play flux as the girls have.
The educator widens the girls’ awareness of actual play situation by revealing the hopeless mode and content of interaction.

*After the adult's adequate and slightly frustrating intervention*, the girls begin to compare their puppets, sometimes in the roles, sometimes as themselves, looking carefully at the puppets’ clothes (Fig. 47). They begin the mutual investigation (phase A) and see some novelty in the other (phase B). But the utterances are still expressive and insisting. Their mutual investigation is biased. It turns their attention out of the reality of the other and leads to defending their own viewpoints.

*Fig. 47. The mutual investigation turned to negative evaluation of the other and to self-defense.*

*Lotta:* You don’t have a red dress like mine has

*Liina:* (...) But mine is nicer than yours

*Lotta:* But guess what, Red Riding Hood has to have a headscarf and she has to have a silken dress

*Liina:* But it (your puppet) does not have a headscarf!

*Lotta:* This is a headscarf!

*Liina:* It is a hat!

*Lotta:* This is a headscarf

*Liina:* But you don’t have this kind of stick

Liina shows to Lotta the foot of her puppet. A short pause, girls are looking at their puppets’ feet.

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The system of play relationships arising between Liina and Lotta after the adult’s intervention (Fig. 48) is at risk. The relationship energy fades. Defense of self-position and of the puppets’ appearance entails the increase of self-expression energy. The relationship system has low mutual awareness and falls into an alternation of the projection resistances. The attention and the movements are chaotic. The actions and the utterances are subordinated to the projections and the fantasies.

Fig. 48. The new attempt to build up a play relationship stops at the beginning of phase B.

*Lotta:* But I have feet … everyone will laugh because you have a stick for feet

*Liina:* But my son will not laugh!

*Lotta:* But your son is not here – so that PUM

Lotta begins to poke at Liina’s puppet with her puppet. Then she turns away from the sofa, her right hand falls down from the sofa holding a puppet (see Fig. 49). The two-girl system fades (Fig. 50).

Fig. 49. Liina and Lotta’s system is destroyed.
Fig. 50. Liina and Lotta’s system is lifeless.

After that, Lotta begins to change her witness’ position near the sofa inside the life space (Lewin) of play: she is leaving a previous role’s reference frame and going around the sofa.

Noora (No) comes to the sofa with a table-theatre puppet [a bear (B)] in her hand. She climbs onto the sofa behind Liina and listens and looks at Lotta and Liina. Lotta looks for a while at her puppet, and then goes to the other end of the sofa. Her attention is out of the relationships and out of a previous place of common play.

Liina’s puppet knocks to the imagined door in front of Noora’s bear. She is changing the topic of a play:

Liina: Knock, knock, knock, will my son come? (see Fig. 51)

Fig. 51. Liina and Noora are building a new play relationship system. Lotta withdraws.

Noora holds her bear against the back of the sofa (see Fig. 52), and then puts it down.
Fig. 52. Liina (R2?) and Noora (B) begin to play.

Noora: I am a bear

At this point a question arises: in which role does Liina knock on the pretend door? Is she still a Little Red Riding Hood or someone older than her pretend son (Noora’s puppet in Liina’s imagination) behind the pretend door? She is, presumably, transformed into someone who is much older than a pretend “son”. For instance, she might be a pretend Grandma or a Mother.

Let’s go back to the episode depicted by Fig. 43. It is obvious that Liina has her R2 puppet lying nearby on her left on the sofa. She is busy at catching Lotta’s puppet while it is a Grandma (Gr). But Lotta interrupts her unfinished business: Lotta pulled back the Grandma puppet. Thereby, Liina arguably continues interaction within previously tensioned and unfinished business, and identifies with the pretend personality of Grandma. If we suppose that she had the interrupted desire to be a Grandma, then it is clear, why she goes on being an “older” pretend self. “Zeigarnick effect”, caused by the interruption of desire, inevitably restores the intention and guides the further activity after removal of the disturbance. This is, however, not the only possibility of Liina’s identification with an older personality.

Contact flux between Liina and Noora passes fluently. Liina talks and Noora keeps silent. Noora’s attention and body movements follow Liina’s puppet’s movements and words.

Noora agrees with Liina’s initiative, attuning to her (Fig. 52 and Fig. 54: Noora’s gaze directions). Thus, the first three phases of relationship (A, B, C) go one after another, arranging two of the girls’ joint nonlinear dynamical system (Fig. 53).
That time Lotta goes away from the sofa to the windowsill. She takes from the windowsill (which is just behind the sofa) a little paper work (PW), which she has made earlier. She lays her R1-Gr transformer puppet away (Fig. 54).

Liina’s puppet goes on saying something with a quiet voice. Noora goes to Lotta, a bear puppet in her hand. Liina comes too, with her puppet. Joint dynamical system of Liina and Noora begins to act as a single whole, a Liina-Noora: gaze directions and common movements are connected to the same object and topic (Fig. 55).
Then Liina looks around Noora, slightly interrupting contact with her, wanting to continue arguing. She says to Lotta “funny Red Riding Hood”, tells that she has called to her son, says that Lotta’s puppet is stupid and points under its dress, at the “Grandma-version” of the puppet. Lotta gazes for a bit at her puppet, under its dress. Old modes of negotiations are tried to restart the previously destroyed system of Liina and Lotta.

Noora follows the situation from the side, but puts away the bear toy, goes around Liina and also leaves their previous common spatial location. She comes and asks from Lotta something about the baby Red Riding Hood (R1 puppet is on the windowsill to the right of Lotta) (Fig. 56). Lotta and Liina stop their arguing: previous Liina-Lotta system is unstable.

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**Fig. 55.** Noora and Liina pay their attention simultaneously to Lotta’s paper work (PW).

**Fig. 56.** The three-girl system’s trial with a paper work (PW) as a source of a common topic or interest (the sense of joint play).
Liina looks in the same direction as Noora, manifesting the stability of their joint system. Lotta begins to show her handicraft to Noora. Noora looks at it, and so does Liina.

This is a three-girl system trial sequence: Noora asks about baby Red Riding Hood, and then Lotta proposes her handicraft as a possible sense organizer in a play (a possible figure of Gestalt approach). A process of spontaneous search of the shared sense – a figure (need) or a goal – in joint play is intertwined with the negotiation patterns, which are manifested in alternation of Noora’s and Lotta’s activities (phase B) (Fig. 57).

Fig. 57. Phase diagram of three-girl system.

The mutual investigation, seeing and hearing the other, and the involvement of the novelty of paper work (PW) allows advancing phases A and B in the three-girl system (Fig. 57). The contacting trial, however, is interrupted by Lotta: she removes her handicraft to the windowsill and stops her narrative, attracting Liina’s and Noora’s attention.

Therefore, relationship system of Liina and Noora remain a whole. They withdraw synchronously from the Lotta’s previous proposal, turning their attentions to the windowsill (Fig. 58).
Liina and Noora continue manifesting joint systems’ behavior by the attunement of attentions and coordination of movements, while withdrawing from Lotta’s paper work (PW). When Lotta puts her handicraft away and looks at Liina, she (Liina) begins to be interested in the bigger handicraft on the windowsill (a winter landscape) (WL). This is the next trial to find the shared sense of joint play for the three-girl system.

Noora goes to the left to Liina. At that moment, Lotta takes her transformer puppet Red Riding Hood (R1). Noora attunes to her: she follows Lotta’s interest and moves towards her. But Lotta does not notice Noora’s attention again, and puts the puppet (R1) to the edge – a free place – of the winter landscape (WL) (see Fig. 58). Lotta makes the puppet a part of the winter landscape, offering nonverbally a possible common topic and shared sense of play for the three girls.

At that moment, Noora steps back to her previous place at the left of Liina. Now she is connected to both of the systems that she has recently experienced with the girls. In those situations, Noora demonstrates oscillating movements between the two-girl system (Liina-Noora) and Lotta, doing a permanent mutual attunement between them. But Lotta’s and Liina’s attention is not enough to notice and use that connection.

After Lotta’s removal of her puppet (R1) to the windowsill (WL), Liina begins to imagine (Im) that her puppet will travel somewhere by train (but the talk is so quiet and quick that it is difficult to hear). This is a proposal of cognitive common ground, and it becomes a trial of shared sense at phase C for the Liina-Noora joint system, and, maybe for Lotta. Lotta turns to Liina, the girls begin to
discuss traveling by train or boat, quarrelling a little. Thereby, they make one more unsuccessful attempt to rebuild the two-girl system between Lotta and Liina.

Then Lotta picks up a little picture (LP), studies it carefully (Fig. 59), puts it away and picks up the puppet (R1) again. That time Liina fantasizes about a trip to Oulu.

While Liina is fantasizing, Lotta makes a nonverbal attunement to the Liina-Noora joint system (phase B for the three-girl system). She begins to transform her Little Red Riding Hood puppet into Grandmother (Fig. 60). Liina is staring at her; Noora turns her attention to Lotta’s puppet. Lotta transforms her puppet into Grandma, and continues verbal attunement towards the Liina-Nooras’ joint system (phase B for the three-girl system) (Fig. 60 & Fig. 61). She begins to talk about the journey to England; the ship will depart in 15 minutes.

Fig. 59. Lotta changes objects of possible joint play – a little picture (LP) and a transformer puppet of Red Riding Hood (R1).
Fig. 60. Lotta changes a transformer puppet to Grandma, and attracts Liina’s and Noora’s attention.

Fig. 61. The tree-girl systems’ new elaboration trial: Lotta attunes verbally and nonverbally to system of Liina-Noora.

Lotta (speaks with Grandma’s voice to Liina’s puppet): It is time to go to the ship! Come now to the ship to England!

Liina (says with quick-tempered puppet’s voice, turning to the Grandma):
I do not like you, Grandma, because your daughter Little Red Riding Hood is bullying me!

Lotta: You are much more beautiful than the one who bullied you!

Lotta and Liina attune to one another verbally and nonverbally, appreciating and accepting each other. Thus, they make connections between two subsystems – subsystem of Liina-Noora and subsystem of Lotta, arranging a new three-girl system (Fig. 62 & Fig. 63).
Fig. 62. Lotta – Grandma is accepted by the two-girl system that entails elaboration of new three-girl system.

Fig. 63. Phase diagram of the three-girl system in phase C.

In a few moments, the new three-girl system proceeds in three phases:

A – Perceiving of the other with her role, and beginning of mutual investigation of play participants; learning to see and to hear the other in a play situation;

B – Mutual attunement and mutual awareness inside the relationship system; accepting the other and excitement by novelty of other in offered role;

C – Feeling of coherence and mutuality, through mutual acceptance and coordination in play trials entails inter-subjective space; shared sense of play is “in the air”. A negotiation on roles and interests in joint play trials follows by simultaneous differentiation of individual sense of play from common cultural meanings.

The girls see and hear one another (A) (Fig. 60), they are excited by the novelty of the last pretend personality – a Grandma (B), which is manifested through a
growing play activity (Fig. 62). They accept one another (C) (Fig. 62 & Fig. 63; last dialog between Liina and Lotta) and try a new sense of play in a few interactions. This is a crucial phase in the birth of the joint three-girl system:

D – Appearance of shared sense in joint play through concerted content of play; as a result, Noora takes her bear in hand and moves to the other end of the sofa: this is home position to begin her role play. Then she comes nearer to Liina and Lotta from the other end of the sofa, growling to Liina’s and Lotta’s puppets, and looking alternatively at them and at the Bear puppet. Nora growls really loudly and angrily. Liina and Lotta look at her. Liina turns to Noora and begins to talk to her as to the Bear (Fig. 64), attuning to the suggested role relationship.

![Diagram](image)

**Fig. 64. Phase D is generated as a three-girl system, creating a new subsystem between Red Riding Hood and Grandma.**

This is a further development of play relationship at phases E and F, when play activity is just about developing intensely.

E – Negotiations about joint activity, here – nonverbal; all play means are directed towards fulfilling a shared sense by combining girls’ initiatives; this phase is a good test of previous mutual attunement of roles, and the girls are passing it.

F – Cooperative activity trials and mutual attunement in action are testing the mutuality among girls and synchronizing their initiatives (Fig. 65).
Fig. 65. The relationship phases begin by a combining the children’s initiatives (E) and a role play trials (F).

At these phases, the three-girl system acts as a single whole – the united oscillating system with a shared sense is in the background of the relationship. The participants created the joint system in the negotiations and the trials during the first 4 phases.

Liina and Lotta arranged a contextual subsystem of a Little Red Riding Hood (Liina) and a Grandma (Lotta) in the framework of roles and relationship structures as manifestations of the shared sense. In that subsystem, they have a culturally conditioned relationship of the relatives copied from a well-known fairy tale and from personal life experiences. The socio-cultural characteristics of common ground of play – the grandchild-grandma relationships – give rise to specific relational content of the hidden rules of roles, creating a new narrative in the three-girl system.

Fig. 66. Play relationships between two subsystems in the whole of the three-girl system (phases E-G).
A Grandmother, as a stronger and protective pretend personality (role) in the relationship between a Little Red Riding Hood and a Grandma, helps Lotta in performing the role duties well: she is twice as old as her playmates. All the previous agreements, a mutual coordination and awareness with the shared sense in context allow girls to be totally involved in a play (Fig. 67 & Fig. 68).

Noora’s Bear is growling loudly, Liina looks at her, Lotta too.

Liina (to Noora): What are you growling at? You cannot bully me.

Liina’s puppet goes quickly to grandma (Lotta), catches her, and wants protection.

Liina (to Lotta): Hi grandma, I am afraid because the bear is coming

Noora’s puppet makes an approach to Red Riding Hood – Grandma subsystem growling.

Lotta shakes the scolding Grandma puppet in front of Noora’s Bear, actualizing her role’s hidden rule of the “Little Red Riding Hood – Grandma” subsystem:

Lotta (to Noora): Bear, go away, you cannot bully my daughter.

Noora: Grrrr grrrr grrrr grrr

Fig. 67. Proceeding to play activity with a total involvement at phases G and H.

Liina, after encouragement from Grandma (Lotta), shakes her puppet in front of the Bear furiously, shouting:

Liina (to Noora): Get away, Bear, from my mother – my Grandma (see Fig. 68)

Liina (to Lotta): Come on Grandma, come here!
Liina manifests a non-interrupted flow of play interactions through the following phases:

G – Growing of joint activities’ energy to fulfill a shared sense of a joint play; sticking to the roles, learning inside the play reality

H – Total involvement in joint activity, permeating the boundaries between one – another; dissolving borders between play and reality, between role/personality and actual child. This is the highest intensity of play interaction.

Liina-Little Red Riding Hood turns to the Grandma. Grandma-Lotta, following the socio-cultural rules of her role defends a Little Red Riding Hood from an angry Bear. She gets down from the windowsill and goes towards the Bear-Noora, satisfying the request of her “grandchild” (Fig. 69).
Fig. 69. Phase H activity is a total involvement into the play relationships.

This is a total involvement in play reality, and it goes with constant mutual attunement of girls. For example, when Noora sees Lotta approaching to her as a Grandma, she looks attentively taking turns to Liina and Lotta, and then moves back as a Bear. When Lotta gets down from windowsill on the way towards Noora-Bear, she turns towards Liina-Red Riding Hood and touches with her puppet the puppet of Liina.

The contextual unity of three girls is manifested in the alternation of attention directions, gaze meetings, change of voices and in mutual coordination of movements. This shows the girls’ out-of-play connectedness: being in touch allows girls to perform a continuous mutual attunement. The small “shuttles” into the contextual reality and back into play are keeping and checking out play agreements about the shared sense and the roles, and intertwining the here-and-now play reality.

A Grandma comes beneath Liina, turns to her and touches her puppet, and then goes on towards Bear-Noora (Fig. 70).

Noora runs away (Phase I) (Fig. 71).
Fig. 70. Phase H transforms to phase I: play activity completes a relationship of pretend personalities.

The energy of a joint play with the recent shared sense in the three-girl system fades. Withdrawal from a joint activity (Phase I) (Fig. 71 & Fig. 72) is a phase of alienation from a previous types of cooperation, and from assimilating participants’ experiences. Sometimes the learning trials follow immediately, and they are connected to the individual sense of a previous play.

Fig. 71. Phase I beginning: completion of the three-girl systems’ play relationship.
Fig. 72. End of the play relationship – phase I: the previous roles coherence fades.

It is clear, that the subsystem of Liina and Lotta (Fig. 71) still has the energy of relationships: Liina rebuilds a spatial structure of their system and the rest of the girls continue their role relationships without a Noora-Bear, but also without the previous arguing with one another. A spatial distance between them is shortened (Fig. 73), expressing a smaller psychological distance.

Fig. 73. Phase I: the two-girl system is using the new skills in play relationship trials.

Liina and Lotta continue with each other, in the roles, showing a new kind of the mutuality between them. Liina points under Grandma’s dress, and Lotta watches.

Liina (with quiet voice): Little Red Riding Hood – Grandma – you have little red riding hood under your dress; it should not to be there.

Lotta closes Grandma’s dress very tightly from underneath. She attunes to Liina creatively, and agrees with her:

Lotta (gently): I ate her, now she is in my stomach

Liina points her puppet’s feet, keeping the role of granddaughter, attuning to Lotta:
Liina: Grandma, she scolded my this and this (Liina shows the stick feet and the head of the puppet)

Lotta keeps position of the accepting and the facilitating one:

Lotta: You are more beautiful than everybody!

These negotiations are the typical example of a learning trial – a main “shuttle” into a previously shared sense of play in the phase I by a finally established Liina-Lotta relationship system. Further testing of the play relationship experiences is successful.

Fig. 74. Phase I: Noora’s learning trials with a new table theater puppet of Grandma (TG).

Noora’s further activity is also devoted to the learning trials to use just learned skills. It is seen in the following exchange. Noora comes back, now with a Grandma table theater puppet (TG) in her hand. She utters sounds like walking, quite loudly. Her learning trial is a new pretend personality, which Grandma theater puppet could have performed in a relationship system. But Lotta and Liina do not notice her for a while – not hear nor see her, and are totally isolated from Noora (Fig. 74).

Noora is persistent, and says many times to Lotta and Liina in the role of Grandma (TG):

Noora: Come here, come here.

At that time Liina asks Lotta, where her son is, Lotta answers, that he is not here. There is something fuzzy, their common situation is diffusing (because it is
subordinated to the strange, or to the Lorenz attractor of phase I): the old topic of negotiations is dissolved; relationship energy is going to be fully dissipated.

Talking to Lotta, Liina nevertheless sees and hears Noora. Therefore, Liina changes her spatial position, going around Lotta towards Noora with her Red Riding Hood (R2) puppet.

![Fig. 75. Phase I: Noora’s learning trials attract Liina’s attention for a while.](image)

*Liina*, reclining on the sofa, looks at Noora and asks, if Noora-grandma knows something about the son, and mentions the name of Christopher Robin (Fig. 75).

Then Liina’s Little Red Riding Hood (R2) turns again to Lotta’s Grandma (Gr).

Noora, continuing her learning trials, goes away and comes back very soon with a table Grandma (TG) and a Boy table puppet (TB), probably Christopher Robin.

*Noora*: Hi, wait, this is Christopher Robin!

The learning trials and the dissolving of an old play content (phase I) are interrupted by the bells ringing for the closing circle (Fig. 76 & Fig. 77).

Girls go out of camera vision – the first is Lotta, the next is Liina, and the last is Noora – yelling ”läää läää läää, läää läää läää!”
Fig. 76. Phase I: the end of the play relationships.

Fig. 77. Phase I completion: the learning trials and assimilation of the relationship experiences.

The end of the relationship is interrupted by bells ringing. However, the three-girl dynamical relationship system passed all of the bifurcation sequences (the phases A-I) of a nonlinear oscillating system’s irreversible development.

4.2 Nonlinear dynamics of play: episodes

Selected play interactions are analyzed here in detail. The symbols in brackets refer to the phases of the nonlinear model of relationship and to the features of relationship organization, listed in the Appendix.

4.2.1 Episode 1: unsuccessful trial of relationship building

In Fig. 44 of general analyses (section 4.1) the girls compete for the role. Here we present a series of frames, which show this competition.

*Lotta:* Hi, I am Little Red Riding Hood! (1.2.Pers)
Liina: I am Little Red Riding Hood too! (1.2.Pers; 5.AO.Cnf.) (frames 1–2)

Girls look intensively at their puppets, fiddle about with them in their hands. They begin to express themselves intensively, competing with one another (5.AO.C.) in expressiveness, both verbally and nonverbally (frame 1 of Fig. 78; alternations of 5.PL.E.H.). They do not meet their real experiences as Red Riding Hoods, not going beyond their efforts to insist on their own ideas.

Fig. 78. Liina and Lotta compete instead of listening and investigating one another (frames 1–4).

Competition of their needs to be Red Riding Hoods is, therefore, a superficial, and unaware (2.Cg.Un.). Without a clear position of their own, they have no possibility to negotiate and to express their needs in a play. Their pretend personalities are contradictory to one another, and in expression, they cannot elaborate a shared sense of play. Each girl’s attention is fixed on her own puppet
They are persisting affectively (Att.A3.Un.) using a puppet. Therefore, they are tensioned by their own pretend personalities, and captured by the competitive goal (5.AO.Cnf.). Therefore, the girls are psychologically isolated from one another, even if they are pushing one another physically. They have influence on the common life space without mutual coordination or attunement (for instance, Liina in frames 2–3 of Fig. 78). In frames 2–4 of Fig. 78 the puppets push each other, and the girls yell loudly:

Lotta and Liina, simultaneously: Me me me me!!! (see Fig. 78, frames 2–4).

The girls are going on expressing themselves to one another in mutual isolation and with increasing energy. Their accessibility (5.PL.A.) to one another is low, a mutual expressiveness (5.PL.E) becomes higher at every moment of the interaction. Each is fixated on her own pretend personality and the puppet (1.2.Pers.; Att.A3.Un.). This entails a verbal and nonverbal tension manifestation on the common boundary against one another. Attention to the interaction (Att.A4.Un.) is weak and unstable. It is demonstrated by Lotta’s turning out of the relationships place – the sofa – towards the adult behind the camera (Fig. 78, frame 4).

The girls, increasingly involved in the self-expression, are displacing their interactions into irreality (Lewin). They are fantasizing the virtual “grandma” (Att.A2.Un.). They are trying to use the fantasies to make authoritative statements in order to expand to one another’s boundaries or to defend one from the other.

Liina: Grandma said that I am little red riding hood (2.Cg.Un.) – grandma said that I am little red riding hood

Lotta: But my grandma said that I am little red riding hood (2.Cg.Un.)

The girls’ attention is busy with the affectively charged puppet-roles and fantasies. Therefore, they cannot proceed to self-awareness, sharing and a mutual awareness. In common with self-expression collision, this excludes development of a mutual perception and investigation in phase A. Thus, neither of them has a chance to see and to hear of other. A psychological “blindness” to oneself and to the other, combined by unaware expansion, results in projection resistance:

Liina: You don’t know (?) you are not Red Riding Hood but red man! (6.Pr.Cat.)

The last words Liina pronounce in a whisper leaning forward and slightly pushing Lotta’s puppet. The nonverbal attack (expanding the self-boundary to another’s
life space without negotiations and agreements) manifests a catharsis projection (6.Pr.Cat.). This excludes a proposal of a new role to Lotta by definition. Liina imposes her own dominating position on Lotta, and verbalizes it unaware as a “red man”.

The girls are at the very beginning of phase A (see Fig. 79). They are experiencing difficulties with advancing in contact. The projection (Liina’s last utterance) is a common contact interruption in that phase.

Fig. 79. The phase diagram of relationship between Liina and Lotta: the interrupted trial of phase A.

At this unpromising situation the adult behind the camera intervenes:

Adult (behind camera): Two Little Red Riding Hoods?

Liina glances at adult for a short while and smiles (Fig. 80, frame 1), and turns out of the relationship place (to the right). Her left hand goes on moving a puppet on the sofa (Fig. 80, frame 2) – in the life space of the joint play. Lotta looks at her puppet. A silence sets in for a while. Then Liina continues moving a puppet on the sofa with her left hand, but her gaze is still directed away.

The adult made an intervention with the same expressiveness as the girls (7.E.Id.), in the mode of calling attention and querying (7.Ip-I.CA.). The adult stayed with the same topic of play as the girls (7.ToP.St.), only hinting to them to broaden their views into the current play situation (9.ESA.W.). The educator kept the girls’ attention inside the relationship process (10.ERC.C.; Att.RFl.Aw.), focusing them on inappropriate role choices (1.2.Ch.;1.2.Pers.), and frustrating the competing personalities (9.ES.Fr.).

The adult’s attitude towards play participants was not charged by any expectations of “how it should be” (8.Ex.Out.), only accepting their initiatives in play. The adult demonstrated equal responsibility with the girls in a play relationship (8.R.Eq.). The educator widened the awareness of the girls (9.ESA.W.), calling their attention to ongoing inconsistency (7.Ip-I.CA.) and frustrating the hopeless mode and the content of their interactions.
Fig. 80. Lotta and Liina after the adults’ intervention: a new chance to build up a play relationship.

The adults’ intervention entailed a short reconstruction of the ongoing interaction mode. Both girls turned their attention to the other’s puppet (Fig. 80, frame 3) (Att.A3.Aw.). They began to negotiate: they compared their puppets, sometimes in the roles, sometimes as themselves, looking carefully at the puppets’ clothes. Thus, they moved to the beginning of a new mutual investigation (phase A) and saw some novelty of the other (phase B) (Fig. 81). However, their utterances are still self-expressive and insisting, and full of different resistances. For instance, Liina’s words are manifesting the introjections to Lotta about “how it should be”, and Lotta answers with an introjection also. The conflict escalates and destroys the relationship:

Lotta: You don’t have a red dress like this has (5.AF.B.; 6.Pr.M.; 5.AO.Cnf.)

Liina: (…) But I am finer than you (5.AO.Cnf.; 6.Pr.S.; 6.Int.)
Lotta: But guess what, Red Riding Hood has to have a headscarf and she has to have a silken dress (6.Int.)

Liina: But it (your puppet) does not have a headscarf! (5.AO.Cnf.: Att.A3.Aw.)

Lotta: This is a headscarf! (5.AO.Cnf.: Att.A3.Aw., 6.Pr.S.)

Liina: It is a hat! (5.AO.Cnf.: Att.A3.Aw.)

Lotta: This is a headscarf (5.AO.Cnf.: 6.Pr.S.) (Fig. 80, frame 3)

Liina: But you don’t have this kind of stick (5.AO.Cnf.: Att.A3.Aw.: 6.Pr.S.)

Fig. 81. The new attempts to build up the play relationship interrupted at the beginning of a phase B.

A mutual confrontation (5.AO.Cnf.) wastes the girls’ energy, and the relationship activity fades. Liina shows Lotta the foot of her puppet. A short pause, the girls are looking at their own puppets’ feet (Att.A3.Un.).

The girls’ attention turns out of the other again, it makes them defend themselves and resist contacting to the other, interrupting a relationship flow. The relationship energy fades. The splashes of self-expression energy did not allow the further development of the relationship. A low mutual awareness, the appearance of the resistances makes attention and interactions chaotic. Actions and utterances subordinated to the resistances and fuzzy fantasies.

Lotta: But I have feet … all will laugh (6.Pr.M.) because you have a stick as feet

Liina: But my son will not laugh! (Fantasizing, 6.Def.-6.Pr.Com.)

Lotta: But your son is not here (Att.A3.Aw.) – so that PUM (straight aggression) (Fig. 80, frame 4)
Lotta begins to poke with her puppet at Liina’s puppet (Fig. 80, frame 4). Then she turns out of the sofa (3.Non.), her right hand with the puppet falls from the sofa down (Fig. 82, frames 1–2).

The contact is interrupted totally: Lotta manifests it both verbally (she is silent) and nonverbally (she turns out of joint play area (3.Non.)) (Fig. 81, a phase B; Fig. 82, frames 1–2). But she is still in contact with the sofa – a physical common ground of a play (1.1.Env.) in a common life space of a play relationship – by her left hand.

Fig. 82. The end of second contact trial between Liina and Lotta: attempt to build up new relationships fails.

At that moment another girl – Noora – is coming. She has a table theater puppet of a Bear in her hand (1.2.Pers.)(Fig. 82, frames 3–4). She climbs up to the sofa (Fig. 82, frame 4) (1.1.Env.), contacting to physical common ground of a play,
and entering into the common life space of a play. Lotta sees that, looking at Noora for a while (Fig. 82, frame 4).

### 4.2.2 Episode 2: successful trial of relationship building

Before the episode, Liina was staying on the sofa with Noora and fantasizing about the trip to Oulu (Att.A2.Un.).

Lotta makes a nonverbal attunement (5.AO.A.) to the Liina-Noora’s joint system (phase B for three-girls system). She begins to transform her Little Red Riding Hood puppet to the Grandmother (1.2.Pers.; Att.A3.Un.) (Fig. 83, frames 1–3). Liina is staring at the puppet (Att.A3.Un.); Noora, with a Bear in hand, is turning her attention to Lotta’s puppet also (Att.A3.Un.). Lotta continues a verbal attunement to the Liina-Noora’s joint system (phase B for three-girls system) (5.AO.A.) and begins to talk about the journey to England; the ship will depart in 15 minutes.

*Lotta* (speaks with grandma’s voice (1.2.Pers.: 5.AF.F., 5.AO.A.) to Liina’s puppet): It is time to go to the ship! Come now to the ship to England!


I do not like you, grandma, because your daughter Little Red Riding Hood is bullying me! (Fig. 83, frame 4) (5.AO.C.L.)

*Lotta*: You are much more beautiful than she, who scolded you! (5.AO.A.; 6.Pr.Com.)

Lotta is constantly attuning to Liina verbally and nonverbally (5.AO.A.), appreciating and accepting her as she is. Liina tries to continue, controlling of Lotta verbally, as she did several times before, but she does it with a lower intensity (5.AO.C.L.). Liina manifests much more nonverbal attunements to Lotta, keeping the same accessibility and expressiveness as Lotta does (5.CL.C.; 5.PL.E.E.; 5.PL.A.E.). She stays, looking alternatively at Lotta’s puppet (Att.A3.Un.) and at her own (1.2.Pers.; Att.A3.Un.), and probably makes the cognitive attunement also.
Fig. 83. Transforming of Lotta’s Red Riding Hood into Grandmother creates the shared sense and a cognitive common ground of play for the three-girl system.

At that moment, Noora sees a Grandma’s and Little Red Riding Hood’s coherence (Att.RFl.Un.). She seems to accept the current event with the appearing shared sense and a renewed topic of the relationship. Noora takes the Bear in hand and moves to another end of a sofa (Att.Beh.Un.), proposing the beginning of a joint play activity. Then she approaches to Liina and Lotta nearer from the other end of sofa, growling loudly (1.2.Pers.; Att.Beh.Aw.) to the puppets of Liina and Lotta. She also attunes to them, looking alternatively at them or at the Bear puppet (Att.A3.Aw.). Nora growls really loudly and angry (Att.A1.Aw.; Att.RFl.Aw.). Liina and Lotta look at her (Att.A4.Aw.). Then Liina turns to Noora (Att.A4.Aw.) and talks to the Bear, attuning to suggested role relationships (5.AO.M.).
This is a crucial moment of a mutual attunement and the three-girl system delivery. It indicates the elaboration of a shared sense of play (Ph.D.2) (Fig. 84, frames 1–2): with Lotta’s Grandmother appearance, Noora begins a mutual attunement in action (Ph.E.2) (Fig. 84, frame 2) and joint activity trials (Ph.F.2). An attunement in action (Ph.F.2) lasts along the whole play activity (Ph.F2-H2). This is manifested, for instance, in mutual attunement and coordination between Liina and Lotta: the touches between puppets (Fig. 83, frame 4; Fig. 84, frames 3–4)) and the gaze alternations between the girls in play activity (frames 1–4 of Fig. 83; frames 2–4 of Fig. 84).

Fig. 84. The three-girl system delivery and mutual attunement.

The mutual attunement, starting with the shared sense delivery (Ph.C2-D2) lasts to the end of the whole relationship activity (Ph.12), and supports the flow of relationship in play. The relationship is oscillating also between two “levels” – the
level of involvement in play activity intertwined with the orientation episodes out of a play activity.

4.3 The mutual attunement in uninterrupted flow of a play relationship

The mutual attunement and coordination (Fig. 84, frames 3–4; Fig. 85), denoted as synchronization between self-sustained oscillation systems (in the three-girl system), needs additional work. It includes the alternations of attention directions and the unfolding of energy / action of the participants, which reconstructs a spatial structure of the common relationship system. It excludes persisting on the self-expression and the resistances, and demands a mutual acceptance of the chosen roles by all play participants. It demands to elaborate and to keep agreements on the common topic of play and observing the shared sense of play. Let us look on some episodes of mutual attunement in the joint system of girls’ play.

4.3.1 Example 1

In Fig. 85, frame 1, Noora is registering the appearance of Grandma (Lotta) and her negotiations and attunement to a Red Riding Hood (Liina) (Ph.C2-Ph.E2 of three-girl system). Noora moves to the other end of the sofa, increasing a distance between Bear and “Red Riding Hood – Grandma” subsystem (Fig. 85, frame 2) (Ph.D2-Ph.F2).

4.3.2 Example 2

Noora-Bear persists growling to a Little Red Riding Hood after Grandma’s warning her (Fig. 85, frame 3) obeying the hidden rules of the role of a Bear as a “strong enemy” (Ph.G2-Ph.H2). This entails a natural unfolding of a Grandma role’s hidden rules in the pretend play: she should defend Little Red Riding Hood. Grandmother moves from the right side of the sofa (Fig. 85, frame 3) to the left side towards a Bear, and defends her “granddaughter” (Fig. 85, frame 4) (Ph.H2), thereby attuning to her and coordinating the play activities with her.
4.3.3 Example 3

Liina, sees Noora and hears her voice of Grandma: Noora utters the sounds like walking, quite loudly. Her new pretend personality makes the learning trial, accepted by Liina. When Liina notices Noora’s loud appeals (Fig. 85, frame 5) (Ph.H2-Ph.I2), she shortens the distance between them, and moves towards Noora (Fig. 85, frame 6), attuning to her trial and coordinating the play activities with her.
Fig. 85. The mutual attunement entails a spatial restructuring of the three-girl system.
5 The research results

The main problem of this research was – how a nonlinear phenomenological model of human relationships is possible? The answer was sought theoretically and empirically.

Our theoretical research started by analyzing verbal and linear relationship models. The focus was on nonlinear elements in them. But their integration into a comprehensive model presupposed multidisciplinary and phenomenological approach. For example, integration of knowledge from the Gestalt-therapy and humanistic-existential therapy required different experiential dimensions. Coordination and attunement has to be taken into account because of crucial importance for understanding basic mutuality and nonverbal (preverbal) psychological development. In addition, the previous scientific and practical experience from helping relationships shows, that phenomenological modelling of relationship flow is successful only when it uses the generalized scientific concepts. They reflect professionally recognizable relationships characteristics of self-in-environment, qualitative shifts and changes of relationship flow. But they do it in a chosen approximation. The approximate knowledge of the observed and experienced dynamic phenomena cannot be achieved by verbal classifications and “objective” “Aristotelian mode of scientific thought”. They are restricted by verbal definitions, statistical probability of random events, and have no means for dynamic modelling.

Phenomenological reality of relationships flow can be attained by using “Galileian mode of scientific thought”, which Lewin proposed. He constructed models of the psychological forces by using classic dynamic view and mathematical topology. Methodological ideas were combined from several disciplines. We also make use of the ideas and phenomenological views from general systems approach, synergetic or nonlinear dynamic systems.

This research devoted to dynamic modelling of relationships, therefore, is mainly a theoretical multidisciplinary research. The research problems have a theoretical nature, and the main result is a hypothetical new model of human relationships. The main problem was divided into sub-problems, which are each answered in the following.
Sub-problem 1

How is it possible to integrate previous linear relationship models and Vygotsky’s model of the ZPD into the phenomenological models of relationships?

The possibility to develop phenomenological modelling of relationship system is raised from phenomenological view, or with “appearance of things as they present or show themselves to our experience”, to consciousness (Stern 2004, 8). Therefore, we avoided taking interpretations as facts, because they are not phenomenological data. For instance, Politzer’s “dramatic thinking” and “dramatic collision” in ZPD (see 1.1.1.) are not phenomenological facts but rather emotional evaluations or interpretations, and we cannot use them. But Vygotsky’s concept of The Zone of Proximal Development is a phenomenological and metaphorical view of relationships as dynamic system. A professional helper or skilled teacher can register ZPD almost in each relationship. Vygotsky’s view on child development in general explains many qualitative changes in child-adult relationships. In the strict sense, his view is not a linear conception.

Cybernetic “elements” of family system and idealized typology of cognitive patterns in relationships, including dynamic attunement (1.1.2) could be used as possible descriptions of phenomenological characteristics of relationship flow. Bruner’s observations on basic mutuality (1.1.3.), Fogel’s dyadic adaptation, co-regulation, interaction patterns and dialogic self (1.2.) are illustrative examples of verbal phenomenological conceptions. More consistent phenomenological perception of relationships is revealed in existential-humanistic- (2.2.) and Gestalt-approaches (1.3.-1.8.) to helping relationships. Holistic Gestalt-theory (Perls, Goodman, Zinker, Ginger & Ginger, Lebedeva & Ivanova) uses a phenomenology of dynamic oscillating system to describe a wide range of relationship characteristics. Even when they are used metaphorically, the oscillation analogies provide a satisfactory explanation of self-environment functioning and subjective change.

Phenomenological view and oscillation analogies are not the only concepts producing applied knowledge to be used in helping relationships. Besides verbal analogies there are nonverbal scientific models. The concept of contact cycle is one of them. Lewin was the first psychologists who used scientific phenomenological modelling. Many of his concepts had an influence on Gestalt-therapy. He developed the tension system concept originating in individual. It shows deliberate actions of a person as behavior in field of psychological forces.
Gestalt-therapy adopted this phenomenological idea, according to which intentions integrate all psychological events of a person. Therefore, the idea of dynamic tension system is a central functional and motivational idea in my research. This concept helps to generalize so different relationship phenomena – from Vygotsky, Bruner and Fogel to Bugental, Perls and Zinker. With the help of this concept the description of the meta-system of self-in-environment (selves-in-environment) is possible and oscillations of psychological forces can be depicted multidimensional. The methodological potential of nonlinear dynamical system is demonstrated by elaborating a unit of relationship analyses from nonlinear oscillator (3.1.-3.10.2.). Therefore, even linear conceptions of relationships are understood as particular cases of generalized nonlinear oscillator. This is possible because the integration of these concepts is not verbal, but mediated by the generalized phenomenological model.

Sub-problem 2

Which qualitative nonlinear features of professionally organized relationships can be taken into account in generalized nonlinear dynamic model of relationships?

First, my model explains four phases in the change of relationships and contact cycle (1.4.). In self-environment system, the moment of qualitative change coincides with the resonance of main self-vectors, and their synchronization – in dynamical system of selves-in-environment (3.10.2. & Fig. 32.). Therefore, it entails a wide restructuring of the field of psychological forces and life space at each phase associated with the sequence of four attractors in phase space. Previous studies on relationships have not reported this theoretical result earlier.

Second, at each phase of relationships, or at each attractor’s basin, there are many psychological phenomena depending on individual and mutual awareness, attention and intention direction, which define the main activity domain. Each self-function – a psychological force (Lewin) – expresses an appropriate quality and direction inside the life space. These directions’ alternations have a crucial influence on activity of the relationship system, and thus, on the dynamics of the nonlinear oscillator in the phase space. For example, attention directed inside self-boundaries, is necessary for relationship flow at a point attractor, but causes interruption at a periodic attractor’s basin.

Two concepts in our model, vector of attention and vector of contact help to trace the dynamics of the field of psychological forces’ on the boundary. Vectors
of amplitude (Personality-function) and frequency (Id-function) are more important in preparing and to bring about sudden changes between metasystem of self (self’s) and environment. Specific alternations of these vectors happen at the most intensive relationship phase (torus attractor’s basin) and at the end of relationships (in chaotic or strange attractor’s basin). This often escapes professionals’ attention.

Third, the dynamics of attention and activity is observed parallel with structure and current energy of relationship system. These hidden nonlinear features of relationships are taken into account in my model. Mutual connections between vector-functions (attention, contact, Id- and Personality-functions) are different for individual and group work, and for different history. This is a very important addition to practical organization of relationships. This opens radically new possibilities for organization, prediction and analyses of relationships.

Sub-problem 3

What kind of methodology is needed for the phenomenological nonlinear dynamic model of relationships based on Gestalt-approach?

There are two intertwined flows of methodological transitions in this kind of research. One of them is a transfer from linear to nonlinear thinking. But in psychology it is possible only with a transition from the “Aristotelian” to the “Galileian mode of scientific thought”.

The “Galileian mode of scientific thought” gives a possibility to study a single case in psychology. It is possible because of using the phenomenological scientific model of deliberate activity. In this study the model of dynamic tension system is applied (Lewin). But Lewin & Zeigarnik suggested a linear tension system as discharge of intention. Lewin’s conceptions from dynamic theory of personality and vector psychology are based on up-to-date fundamental sciences, but processes are linear or linearized. The validity of single case study using linear model of tension system cannot be combined with nonlinear characteristics demonstrated in many relationship studies. Applied Gestalt-therapy knowledge (F. Perls, P. Goodman, J. Zinker; see 1.3.-2.4.) and Heckhausen's remarks on Lewins theory (2.4., 3.6.) express these inconsistencies. There are inappropriate combinations of linear models and nonlinear qualitative dynamics, step by step development notions (scalar summarizing) and many directed influences (vector forces’ combinations) in the field of psychological forces.
Therefore, it is necessary to develop a phenomenology of nonlinear tension system (3.1.-3.9.). This transition is possible if we start from holistic model of contact cycle, using linear oscillator. For this purpose we used two constituents:

1. Nonlinear methodology of “new holism”

   The best nonlinear methodology was offered by the Moscow State University’s Computational Mathematics Department, the Institute of Applied Mathematics and the Institute of Philosophy of Russian Academy of Sciences (Knyazeva & Kurdyumov 1992). It was developed in dialog with I. Prigogine, and named a “new holism” (see 3.1.).

2. Nonlinear oscillator

   In order to adjust the oscillating model of contact cycle to nonlinear phenomena in relationships we picked out a nonlinear dynamical self-sustained oscillation system, or nonlinear oscillator (Pikovsky et al. 2003), which made possible to proceed from linear to nonlinear oscillator (see 3.8.1.).

   Because of these decisions, nonlinear oscillator acts as a nonlinear dynamical system of self-environment (self’s-in-environment). It forms a common dynamic unit both for self-environment and self’s-in-environment dynamical systems.

Sub-problem 4

What kind of empirical material is appropriate to demonstrate qualitative features of developing nonlinear model?

In general, any taped relationship flow can be used to demonstrate qualitative features of the developed nonlinear model. However, professional activities (helping relationships or relationship-sensitive education) better demonstrate critical nonlinear characteristics of relationships. This work is started in 2006 in Saint-Petersburg Gestalt Institute and the main ideas are applied to social work. The challenge of empirical research in this study was to transfer the tools of organizing helping relationships to education, and to demonstrate the potential of nonlinear methodology.

We decided to start the demonstration of the methodological potential of our nonlinear model with the available videotaped material on children’s pretend play, which was already analyzed using other qualitative methods. For this purpose we selected a few episodes of the play of “Little Red Riding Hood” in The
Laboratory for Creative Play at Kajaani campus (University of Oulu, Finland). Data is collected and prepared by M. Bredikyte (2006). The use of nonlinear dynamical model radically moves the focus of analysis of play from traditional formal characteristics (roles, plots, play actions etc.) towards emotional dynamics of play, children’s initiatives and self-regulation, which are reliable indicators of the unfolding tension system. The selected spontaneous pretend play with clear beginning, lawful development with natural interruptions and difficulties, completion and withdrawal demonstrated what new aspects of play the new model reveals (see 4.1.-4.3.).

We did not use a full-fledge vector denotations and nonlinear dynamical systems terminology in this analysis. This is a task for future. In our theoretical hypothesis, we expected that theoretical research of relationship models should prove, that phenomenological nonlinear dynamic models of human-environment and human-human relationships reveal new qualitative characteristics, which are not visible in earlier linear models of relationships. Nonlinear dynamic models offer better tools for professional analysis and use of relationships in education, therapy and social sector.

The elaborated model showed that the theoretical hypothesis was supported on general level. But tool for educational analyses and other domains need specific elaboration. This model is an appropriate unit for analyzing relationships in professional training.
6 Discussion

Two factors inspired me to start this research many years ago.

First was Lev Vygotsky’s conception of the *periods of child development* (1984). Reading original texts, I was attracted to the holistic dynamical model of development. In dynamical picture of development, each period of development is connected to others with some hidden links in latent periods, and developmental shift is *qualitative* and *irreversible*. Fundamental shift takes place during *critical periods* as sudden change. This coincides completely with the behavior of nonlinear dynamical systems, for instance, with nonlinear oscillator. Nonlinear dynamics, however, was developed 50 years after Vygotsky. An example of Vygotsky’s dynamical view on development is his description of higher mental functions in the zone of proximal development (ZPD):

“…the zone of proximal development defines those functions that have not yet matured but are in the process of maturation, functions that will mature tomorrow but are currently in an embryonic state. These functions could be termed the "buds" or "flowers" of development rather than the "fruits" of development. The actual developmental level characterizes mental development retrospectively, while the zone of proximal development characterizes mental development prospectively” (Vygotsky 1978, 86).

Vygotsky’s dynamical vision of child development and the idea of genetic experiment are impressive. In order to demonstrate the dynamism of Vygotsky’s concept we use a bifurcation sequences unit with one control parameter (Fig. 86), elaborated in this research, as model of Zone of Proximal Development. The nonlinear unit of ZPD requires that we apply the experience ("perezhivanie") as a unit of consciousness (Vygotsky 1984, 382–385). It is connected to manifestation of a control parameter. This is a research task of the future. We suppose that it can be solved by integrating Vygotsky’s theoretical position and nonlinear dynamical systems theory. Fogel (2006) took first steps towards the integrative solution in his description of mother-infant relationship sequences.

The second factor was my experience as a professional helper in Gestalt-approach, a client and a University teacher. Cycles of relationships – intrapsychic and interactive – deepened my experiential and theoretical knowledge, showed oscillatory dynamics of relationships and awareness in change. Periodic and quasi-periodic models of relationships used in Psychodrama of J. Moreno, Logotherapy of V. Frankl, Psychosynthesis of R. Assagioly and in other models of...
helping relationships (Rudestam 1990) prompted to study oscillating dynamics of relationship in more detail.

Fig. 86. Simplified bifurcation sequences of nonlinear oscillating system as illustration of ZPD.

After writing the first article (Safarov 1999) on contact cycle modelling in Gestalt-therapy, I found the article by Frederick Abraham (Abraham 1997). He explained the dynamical systems conceptions appropriate for psychology, and illustrated it with his previous research results (Fig. 87.).

The response diagram for mood demonstrates nonlinear connections between mood and self-image for different values of a control parameter of dependency in phase space. In our research, we prefer more generalized functions of self. For instance, the transfer to generalized self-functions makes possible the use of holistic relationship experience (“being with”) in place of particular “as if” identification (1.8.), restricted by self-image (Fig. 87) or self-conception.
Fig. 87. Response Diagram for Mood. The three-dimensional state space is for the variables of mood, self-image, and their rate of change. The control parameter is dependency à la Freud. Attractor types and bifurcations are indicated (Abraham, Abraham, & Shaw (1990); Abraham & Gilgen (Ed.) 1995)

Fig. 88. The tension system creating bifurcation sequences of the nonlinear oscillating system of the self (see also Fig. 23)
Comparison between similar parameters shown in Fig. 87. and Fig. 89 reveals, that self-image parameter (Fig. 87) is a particular case of generalized vector of amplitude oscillations [O’M] (3.8.2.) (Fig. 89), which corresponds to Personality-function of self.

The mood is a particular case of Id-function of self. In our research, it is denoted by generalized vector of rhythmic rotation [O’L] (3.8.2.) (Fig. 89), corresponding to wide range of self-energy experiences.

**Fig. 89.** The momentary vector of intention [O’I] is a vector sum of all psychological forces in the system: the generalized vector of amplitude (Personality-function) [O’M] and the generalized vector of rhythmic rotation [O’L] (see also Fig. 22)

The highest benefit of these generalizations in a vector form for psychology is their vector sum resulting in vector of intention. On one hand, this is in line with Lewin’s tension system. In our research, two main vectors of oscillation system of self create a dynamic tension system. On the other hand, vector descriptions are in line with the scientifically well-developed models of oscillator.

This oscillating vector system occupies the whole dynamical phase space (Fig. 88). Therefore, we do not need to investigate mood and self-image separately (Abraham ibid.; Fig. 87). Our research offers a better picture on nonlinear oscillator’s behavior with the control parameter of awareness (or mutual awareness) and two main vector parameters of rhythm (Id-function; emotions or mood in particular case) and amplitude (Personality-function; role, self-image or self-conception in particular case).
The unit of analyses of relationships and their organization demonstrates full
dynamic functioning of relationships in the phase space (Fig. 88), and offers a
scientific tool for the study.

The unit helps to understand relationships not only in Gestalt therapy but any
relationships with shared sense. It has advantages and shortcomings.

In contrast to models in theoretical part, the unit reveals hierarchical structure
of the whole self, manifesting in relationships. Metasystem of self governs
functions of the self in order to organize relationship with the environment and / or
with the others. Connections between human beings represent indivisible non-confluence.
Professional organization of relationships demands dynamical equilibrium between
metasystemic relationships (ontological meeting) and relationships between selves. The tools of this complex organization are elaborated in existential-humanistic helping relationships.

These tools can be adjusted to new models without difficulties. However,
there are several difficulties in applying the model. First, the use of a new model
requires special education of professional helpers. Some trials were conducted in
educational seminars for professional Gestalt-counselors in Saint-Petersburg
Gestalt Institute in 2007. These trials and teacher training experience in 1999–2005 at The Karelian State Pedagogical University, proved the necessity of additional education. Second, the use of the model in child education presupposes self-research of the educator. Such programs do not exist yet as far as we know. This is a new challenge.

There are theoretical and practical advantages of the new model. We have
divided them into different types. General theoretical aspects are the following:

1. Ontological-psychosomatic holism replaces psychosomatic holism of
previous models, emphasizing aware metasystem of self and involving more
important characteristics in common dynamical model.
2. Unification of Gestalt approach to helping relationships and Kurt Lewin’s
dynamic psychology based on “new holism” methodology creates a nonlinear
dynamic model of tension system.
3. Nonlinear dynamical systems as domain of fundamental sciences are
connected to science of relationships through applications of Lewin’s theory
in helping relationships. They are familiar for many psychologists and
helping relationships professionals.
4. Research of relationships flow becomes closer to any phenomenological
research in modern fundamental sciences.
5. Practical methods of organizing relationships in helping or education, finds solid theoretical basis with promising developmental potential.

Specific theoretical advantages are:

1. “The Zeigarnik effect” manifests a stable state of created nonlinear oscillator. Dynamical tension system with (joint) intention manifests established and structured relationships with task, object or another person. Tension system with one control parameter passes subtle bifurcation sequences. *Established tension system*, after removal of disturbance, *re-establishes its current structure and follows joint intention dynamics*. In Gestalt language, self re-establishes the chosen personality and fulfills a chosen need or shared sense. This is close to what Fogel calls “a stability of pattern” (1993, 2006). The description of this phenomenon in mathematical terms is the challenge of future research.

2. Sudden change becomes a regular phenomenon of nonlinear tension system. The model can be applied as well to long-term human development as to current relationship dynamics. The change dynamics of phenomena become predictable in general, but remain unpredictable in particular content of studied case: subjective choice making plays an important role in developmental change.

3. Lewin’s interest in qualitative types of “lawful change” of psychological forces is reflected in his three-phase model of deliberate action (Lewin 2001, 125). A fuller theoretical solution is elaborated in nonlinear relationship model with one control parameter.

4. Organization of relationship depends on guidance of three general domains of self-activity in environment – metasystem of self, self-energy and self-structure; theoretical simplicity of this “new holistic” approach, however, reflects a simple theoretical description of very complex phenomena in nonlinear dynamics; in practice, it demands careful development of professional skills in organizing relationships.

5. Important phenomena of cooperation, co-regulation, mutual attunement and mutual awareness manifest a basic mutuality. They are inalienable from relationships of wide scale. They find their theoretical explanation in relations between oscillators. Thereby, dynamics of relationships become a particular case of general scientific laws.
General practical advantages:

1. Theoretical concepts of intention, valence, psychological force, psychological field, coherence between participants, regions, witness (observer), life space, self-energy, self-structure (role) etc. become specific and experiential in the model and can be organized at any relationship event.

2. Integration process of self and its interruptions are visible and changeable as a result from efforts of professional helper and intention of self.

3. Psychotherapy is demystified: an educated helper can apply his professional skills in any relationships domain – in psychotherapy, counseling, social work, education, management, etc.

4. Resistances (defenses) go beyond clinical concern and become a complementary constituent of presence and self-expansion to world, arranging in common a self-sustained oscillation system of single person; thereby, ethical rule of mutual respect and personal immunity gets specific scientifically-based attitude to others’ metasystemic choice.

5. Practical education in relationships organization and analyses is transformed into design of different applications with various deepness of relationship.

The model can help in social work “to cope with uncertainty and continuous change”, it can be used as a tool for reflexive supervision and life-long professional learning (Karvinen-Niinikoski 2004). The model is based on Gestalt view on relationships as creative process, and is already approved in social work practice. However, the theoretically elaborated nonlinear version, involving many mutuality phenomena, needs practical trials to demonstrate the effectiveness of its creative side.

Critical analysis of the model can reveal too general level of description of its constituents. The generalized vector of amplitude oscillations, for instance, includes a Personality-function of self (current self-concept) and other undifferentiated cognitive functions. Even if self-structure, denoted by vector of amplitude oscillations, shows features of autopoietic structure, involving embodied cognition, none of them are studied thoroughly, yet. The same situation is with the generalized vector of frequency, denoting self-energy, or Id-function of self. As main criteria of registration of rhythmic changes, this constituent has no strictly integrated phenomenological manifestations. Even skilled helpers may have different views on main manifestations of self-structure and self-energy of one self.
Additional work should be done to clear up the vectors presented in this study. It is necessary to study carefully the connections between metaphorical, scalar and vector representations of psychological functions/forces. Probably, this work should be performed by combining nonlinear dynamical systems theory and theory of K. Lewin.

It is not obvious that metasystem of self, “the I”, Ego, motivational center, immediate self-being and psychic being coincide with one another. Deep penetration in self, self-transcending experiences of Buber and Frank, Ghosh and Frank, etc. may have significant differences. More self-deepening and self-transcending experiential research should be performed using the model in order to find out their common traits.

Dissipative structure of self and self-boundaries, often understood in this research as the same, still need more specifications. Boundary structures of Lewin, Perls, Parlett and Zinker may have different constituents. Distinction between Personality-function (generalized vector of amplitude), self-boundary and dissipative structure of self (self’s) needs a careful additional research.

Nonlinear dynamical systems area is heterogeneous. The chosen self-sustained oscillation system as the basis of the model is a case with one control parameter and two state parameters, even if it offers invariant view on complex ontological-psychosomatic behavior. Two and more control parameters case will demand much more complex models and mathematical theories.

Further research of the model and its applications can be pursued in many directions and combinations:

- Theoretical research of model constituents.
- Further research of theoretical connections between Lewins dynamic psychology and our model.
- Visual and other qualitative (narratives, interviews) and quantitative data collection in helping relationships (including social work practice) and in education and computer data analyses.
- Computer simulation of chosen theoretical descriptions in chosen particular cases of relationships – qualitative modelling and research.
- Elaboration of applications in education and helping relationships and development of effective technologies of model use.


7 Conclusions

This research is devoted to the elaboration of the phenomenological unit of relationship analyses. The main task of research is to find the appropriate unit of relationship analyses in communicational professions, mainly in education. The unit is based on theoretical notions of Gestalt approach to helping relationships, on the one hand, and on nonlinear self-sustained oscillation system dynamics, on the other hand.

A systemic vision of human personality helped G. Allport (1970; 1971) to describe the expectations for the model of human personality and relationships. He thought that the model should consist of event flux and functions. It should describe the multiscale pattern dynamics. The phenomenology of the units of analyses should satisfy the following criteria:

1. Relatively broad forms of psychological organization of behavior.
2. Approximate knowledge about psychological phenomena.
3. Interstructurance between individual and collective patterns in total structure of social situation (Allport 1970).

The study of communication in family research focused on the connections in a family system and on the family rules (Gurman & Kniskern 1981; Minuchin 1974). This research revealed the well-functioning family system, using a typology of human interaction patterns (Watzlawick et al. 1967). The axioms of communication, the double bind theory and the anthropological typology of interaction patterns increased the interest to the generalized interaction pattern.

Dyadic interaction patterns impressed Bruner (1986) and Fogel (1993; 2006). In agreement with Bowlby (1988) and Stern (2003), they supposed a deep and a fundamental nature of the ties between human beings. Fogel went on developing a theory of the dialogic self using knowledge of the General systems theory, the theory of information and some features of the nonlinear dynamical systems (Fogel 1993; 2006; Fogel et al. 1997; 2002; 2006). However, he does not observe the infant as equal to the adult from the very birth, as Stern did (2003), thereby not observing the third criterion of Allport.

The representatives of classic Gestalt-approach to helping relationships – F. Perls, P. Goodman and J. Zinker – fulfilled all of the criteria of Allport in some extent. They elaborated two valuable phenomenological models – the units of professional analyses of relationship flow. They used the interstructurance between two relationship patterns in the analyses. They used the approximate –
the phenomenological – knowledge to develop the helping relationships practice and theory. They also confirmed that the contact dynamics are manifested in a wide scale of everyday human relationships. Therefore, the Gestalt practitioners are using the different types of the general models of psychological oscillations (Goodman’s, Zinker’s, Ginger’s, Clarkson’s, etc.) in human relationships and in single self – environment interactions (Lebedeva & Ivanova 2004; Clarkson 1989; Zinker 1977; 1994).

However, the theory of relationships in Gestalt approach is verbally explained, only. Verbal descriptions are arranging a structural and functional map of better orientation in relationships dynamics. They help professionals to organize aware relationship flow. Nevertheless, verbally explained theory simplifies and distorts an experiential facet of relationship flux. Moreover, from methodological point of view the verbal construction is a weak and quite unstable base for theoretical conception in fundamental sciences. It is rather a metaphorical pre-conception than scientific explanation.

The vector psychology and the field theory of Kurt Lewin, used in the Gestalt approach to helping relationships, are more scientific theories. The models include many formal mathematical descriptions, and they are elaborated in “Galilean way of thinking”, according to the classical dynamics period of evolution of fundamental sciences. For Lewin it means that there are the psychological laws that allow the valid study of a single case of any psychological phenomenon, in the reference frame of human being. This way of thinking following phenomenological view of fundamental sciences is similar to Allports notions and propositions for psychological units. Thus, Lewin described a witness position’s movements, the intention entailing the tension system; the topological model of a personality, the deliberate action phases and many other concepts as the preconditions for larger theoretical construction.

Fritz Perls’ interest to performance by self of the identification/alienation with environmental object or with the other, to the boundary oscillations and to self-center, named alternatively Ego-function or “the I”, are close to some of Lewin’s research interests. However, in contrast to Lewinian “personality”, the self in Gestalt approach is different. For instance, Ego-functions of self are governed by another self-functions and self-activities for the sake of needs, and control of the boundary activities. The self-center’s oscillations are manifested in the wave-like activities in relationship flow and in their experiencing. These oscillations unfold the wave-like activity of the hidden subjective reference frame. This activity takes place through the self-boundaries, back and forth to the self-
center. “The I” of Perls (1969a), or the motivational-integration center of Zinker (1994) becomes the reference point for these oscillations. Well-organized self-oscillations, originated in the self-center, and conditioned by the awareness growth, are resulting in a subjective change. But exactly these complex self-oscillations, taking place between self-center and environment or/and other self in the field of psychological forces, could be the basis for elaboration of the required invisible unit (in Allport’s sense) for analyses of the psychological dynamics of the self (of the selves) in the relationship.

The need for theoretical elaboration of the dynamical unit of relationship analyses is evident from the foregoing. The need of a new methodology is obvious. The signs of a new nonlinear dynamical systems methodology were found inside the earlier relationship concepts.

For instance, Lewin introduced to psychology the witness positions’ change – the individual reference frame’s dynamics. However, it also came from the relativity theory of A. Einstein as reference frame features. Dilts (1994) showed that the phenomenon of reference frame is of fundamental importance in psychology. The reality is not an empty space box plus objects and/or people inside of it: these medieval notions are mechanistic and psychologically wrong. Anything and anyone in the Universe has its own reference frame. The reference frame is conditioning all the experiences and the data obtained from it.

The relativistic reference frame, put into accordance to self-center, entails many theoretical advantages. First, subjective self-center is a complex-connected metasystem of self, responsible for the whole of the self-functioning in the environment. Second, a tension system of self, depending on a sense- and meaning-making, is manifested through the intentional activity, which is originated in the self-center. It means, that the nonlinear dynamical process of the relationships between the single self and environment or/and the others can be explained relatively to the each self-center. Third, the self-system conducting relationship energy from self-center to environment and others, is manifesting the open nonlinear dynamical system – the nonlinear oscillator. It has the self-energy source and acts by means of the energy circulation in relationships. It has the psychological forces, according to the self-functions and to the awareness activities. Fourth, the awareness, after Enright (1980), can be defined as a flow of consciousness through the self-center. Thus, the attention and the awareness are originated in the self-center. The growing awareness in the different modes entails the deepening of the presence levels (Bugental 1987). This is leading towards the deepest manifestation of self-center – the immediate self-being (Frank 1990) or
the psychic being (1990). The immediate self-being is able to communication with the other immediate self-being through a self-transcendence. To accomplish the subjective change it is necessary to use the skills and the subjective tools, which are sufficiently depend on a deepest self-center. Fifth, the subjective change becomes demystified. It develops with the growing awareness of the psychological forces by the self, which can bring into different types of coherence – resonance or synchronization – in relationship. Therefore, a subjective change, and the learning as a restructuring of self-experiences (existential-humanistic notion) can be described by the nonlinear oscillator’s dynamical changes, or by the model of bifurcation’s sequences (Abraham 1995; Arnold 1990).

Theoretical findings and data analyses show, that the Allports’ expectations from the dynamical units of analyses in psychology were true. These theoretical expectations are in a good agreement with the classical and the nonlinear dynamical conceptions of fundamental sciences. The Lewinian validity of a single case, the self-functions as internal forces, the goal-directed intrinsic exertion and the deliberate actions’ flux dynamics, manifesting the actual psychological field and the psychological forces, come into good agreement with Allports theoretical phenomenological view. Therefore, they became the basic concepts for the elaboration of the phenomenological nonlinear unit for relationship analyses in this current research.

The nonlinear model of relationships is developed in current research using vector and non-vector notions. Children’s pretend play episodes were analyzed and described using nonlinear dynamics. In data analyses, we used a simple interpretation of the relationships. A more complex model was offered in the theoretical elaboration in current research. In fact, the phenomenological-experiential interpretation of relationships in the model can be of the highest complexity. The difference between the offered interpretation and the description possibilities shows the potential of the model elaborated in this research.

The general shortcomings of the old descriptive-explanatory psychology of relationships are the avoidance of a self-involvement into studied phenomena, neglecting a researcher’s self-awareness, and the unaware influences of the researcher’s intervention to the studied phenomena. They are the principle obstacles on the way to the “workable representation” of the psychological forces’ dynamics in life space, required by Lewin.

It is necessary to remember, that the fundamentals of world perception are rooted in a pre-sent infinite field of relationship, which is given us a long before any conceptualization (Watts 1969), and which exert influence on any relationship
Therefore, we need to revise the archaic positivistic concepts of the relationship in the world, and to change the linear thinking about relationships. It is necessary to develop thoroughly the phenomenological nonlinear thinking combined with the aware experiential comprehension. This continues the elaboration of the first-person approach (Lewin 1935; 1938; 2001; Perls 1969a; Varela & Shear 1999) to a relative data and opens the way of scientific phenomenological modelling of the single case (Lewin 1936; 2001) in psychology of relationship.

Further elaboration of the nonlinear model of relationship needs concurrent development of the nonlinear method of analyses of relationships briefly delineated in the current research, involving the mathematical knowledge of the domain.

Practical value of this current research is as follows:

1. The elaborated model of relationships integrates the separate pieces of the applied knowledge of the relationship organization into the integer a whole of the unit of relationship analyses and of the completed relationship flow organization. This entails very practical the one-step use of the offered model with many of accountable factors in relationship flow.

2. The offered model organizes a new – nonlinear thinking of relationship flow and of the participants for many of communication professions. The model does not need the knowledge of the personal history of the participants by the organizer of relationship before the relationship creation. The model does not contain the fixed notions of the participants, thereby allows organizing the relationship in a very wide scale of different personalities free from the risk of prejudices. Clinicians can use the model and discover the relationship flow features, specific for each clinical disorder (for instance, ADHD). This, however, demands the additional clinical research.

The kindergarten and school teachers, as also the school and university teachers, can be trained to use the offered nonlinear unit to organize the relationships, to perform them, and then, to analyze them. The model allows organizing the completed and effective aware relationships in education between the students and between the teacher (educator) and the student. The training to use the model permits to reorganize the conflict situations, unorganized and destructive interactions into the meaningful relationship flow. This also helps to recognize and to perform aware and responsible interruption of the unwanted relationships.
The competent relationship organization could be performed at *each* moment of the relationship development and with *any topic* of the intercourse.
References


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Frank, S.L. (1997). Real’nost’ i chelovek [The reality and the human being]. Saint-Petersburg, Russia: RHGI.


Appendix 1 List of definitions and explanations

**Phenomenology**

“Phenomenology is study of things as they appear to consciousness, as they seem when they are in mind. This includes perceptions, sensations, feelings, memories, dreams, fantasies, expectations, ideas – whatever occupies the mental stage. Phenomenology is not concerned with how this things were formed by or popped into the mind. It also avoids any attempt to explore the external reality that may correspond to what is in mind. It concerns only the appearance of things as they present or show themselves to our experience. It is about mental landscape we see and are in at any given moment” (Stern 2004, 8; bold type added).

“Phenomenal fact: Fact which can be observed directly.” (Lewin 1936, 214)

**Phenomenological constituents of the self-in-environment in Gestalt-therapy and counseling**

“The self is ... a process and not a static abstract mental entity; it provides a way of describing an ongoing, evolving and transforming process in which we continuously engage, configuring the experiential field, or choosing our reality” (Parlett 1991, 77–78; emphasis added).

The Id function of the self manifests nonverbal expressions of life energy. It expresses conscious or unconscious current needs and preferences of the self. The Id-function is observable through a wide range of continuous psychosomatic phenomena. It manifests the self-energy in general: intrinsic impulses, feelings, and basic vital needs with their nonverbal correlates (Ginger & Ginger 1999, 120–121). They appear as blushing of the skin or hunger, changes in respiration rate or appetite in the wider sense (Lebedeva & Ivanova 2004, 125).

The Personality function of the self shows the current self-concept of a person. On one hand, it is responsible for the integration of life experiences and for structuring the activity (Ginger & Ginger, 120–121). On the other hand, it manifests a chosen mode of integration from the spectrum of possible modes – life-long roles and positions of the self, fit for the current situation. It can be described as “now I am that person” or “I am in that role, that position now” (Lebedeva & Ivanova 2004, 126–127). This function is a cognitively oriented constituent of the self, a chosen self-structure fit for the current event. It has a
tendency to find the center of the individual, responsible for centripetal modes of integration (Zinker 1994, 119).

Ego-function of the self in modern Gestalt-therapy provides the aware contact or withdrawal between the organism and the environment, consent or denial of the self for contact, and responsibility for the choices (Lebedeva & Ivanova 2004, 126). The Ego-function’s phenomenology is seen in the choice between contact with and withdrawal from the environment, and in control of behavior on the boundary. Interruptions of the Ego-functioning, therefore, are known as losses of the Ego-function, or as the Ego-defense mechanisms, resistances or avoidances (Ginger & Ginger 1999, 126–139).

Awareness is a consciousness flow through this moment (Enright, 1980), a total realization of what is going on at the present moment, the attentive attitude toward the whole range of somatic and emotional replies of the self, appearing with the inner and outer influences (Ginger & Ginger 1999, 285).

Some Lewinian Concepts

“Communication: Two regions are in communication if change of the state of one region changes the state of the other.” (Lewin 1936, 217)

“Dynamic: Facts or concepts which refer to conditions of change, especially to forces, are called dynamic. Dynamic facts can be determined indirectly only.” (Lewin 1936, 213)

“Environment: Everything in which, toward which, or away from which the person can perform locomotions is part of the environment.” (Lewin 1936, 216)

“Force: Cause of change; a basic concept of vector psychology. Properties of a force are: strength, direction and point of application. Strength and direction can be represented by a vector.” (Lewin 1936, 218)

“Field: Space, conceived as having a certain characteristics at every point.” (Lewin 1936, 216)

“Gestalt: A system whose parts are dynamically connected in such a way that a change of one part results in a change of all other parts. This unity may differ for different kinds of changes.” (Lewin 1936, 218)

“Life space: Totality of facts which determine the behavior (B) of an individual at a certain moment. The life space (L) represents the totality of possible events. The life space includes the person (P) and the environment (E). B = f (L) = f (P, E). It can be represented by a finitely structured space.” (Lewin 1936, 216; emphasis added)

“Law, empirical: a law defines the functional relationship between various facts. These facts are conceived as types, i.e., historical time indices do not enter a
law. A psychological law can be expressed by an equation, e.g., of the form \( B = f(L) \). The laws serve as principles according to which the actual events may be derived from the dynamic factors of the situation.” (Lewin 1936, 214)

“Region, determination of: (1) A psychological region can be determined by its qualitative properties and by the topological relations of the region or of its boundary to other regions or their boundaries; (2) by psychological processes which connect points, especially by locomotions or communications.

“Region, psychological: Part of life space. Everything that is represented as a region in characterizing a psychological situation must be a part of life space. A region is not necessarily a connected one.” (Lewin 1936, 216–217)

“Situation: Life space or part of it conceived in terms of its content (meaning). The life space may consist of one situation or of two or more overlapping situations. The term situation refers either to the general life situation or the momentary situation.” (Lewin 1936, 217)

“Locomotion: Change of position. Locomotion can be regarded as a change of structure: the moving region becomes a part of another region. Locomotion can be presented by a path which can or cannot be carried out. This path characterizes a change of position within a field which otherwise remains sufficiently constant. One can distinguish quasi-physical, quasi-social, and quasi-conceptual locomotions.” (Lewin 1936, 216)

“Person: The person is represented as a differentiated region of the life space; however in the first approximation he can be represented as an undifferentiated region or a point.” (Lewin 1936, 216)

“Position, determination of: The position of a point in the life space is characterized by the region which includes it. The exactness of the determination depends upon the extent to which one can distinguish subregions within the region in question.” (Lewin 1936, 216)

“System: A region considered in regard to its state, especially to its state of tension.” (Lewin 1936, 218)

“Tension: A state of a region relative to surrounding regions. It involves forces at the boundary of the region which tends to produce changes such that differences of tension are diminished.” (Lewin 1936, 218)

“Power field: The sphere of influence of a person. It can be represented as a field of inducing forces.” (Lewin 1936, 218)

“Valence: A valence corresponds to a field of forces whose structure is that of a central field. One can distinguish positive and negative valences.” (Lewin 1936, 218)
Dynamical and nonlinear dynamical systems

**Autonomous oscillator, or oscillator** – is a *generalized active system* (object or organism) which pulsates with its own rhythm defined by internal state parameters. The oscillator:
- Derives power from some source of energy and sustains constant oscillations of the system until the energy comes to end.
- Oscillation shape does not depend on entry conditions on the way the oscillations started.
- If disturbance influenced the oscillations, the oscillator will restore the shape of oscillations after removal of the disturbance (Pikovsky et al. 2003, 26–27).

**Nonlinear oscillator** – is a generalized oscillator with an autonomous energy source which compensates dissipation of energy in it. Nonlinear models describing its functioning are called *self-sustained oscillation systems* (Pikovsky et al. 2003, 48–49, 242–243).

**Phase** in this research, as well as in nonlinear dynamics (Pikovsky et al. 2003, 52) has several meanings. **Phase of oscillation** – is a magnitude proportionate to the part of an oscillation period, and in one period of rotation time gets a value of $2\pi$. Phase defines the current state of periodical oscillator unambiguously. In the research into synchronization of two different oscillators, this parameter is highly important (Pikovsky et al. 2003, 32–33)

In phase space, coordinates of a concrete point at a momentary state of dynamical system are denoted by "phase point", and movements describing evolving dynamical systems as *trajectory of phase point* (ibid 52). This kind of “phase” contextually does not correspond with the phase of oscillation.

**Dynamical system** – a system with determined behavior. It allows prediction of its future state based on conditions by which the current state of the system is determined (Pikovsky et al. ibid. 47). It “involves a set of interacting variables (the mathematical theory requires that their behavior meets certain conditions of smoothness and continuity, and of infinite resolution and duration).” (Abraham & Gilgen 1995, 32)

In a simple case, dynamical systems behavior may be described by two parameters, which determine the current *state of the system*. Two interconnected variables changing in time present dynamical system coordinates in *phase space* (*state space*). The depiction of these two variables’ interconnectedness is a *phase*
portrait of a dynamical system. This point in a portrait is often called a phase point (Pikovsky 49).

Phase portrait (Guastello 1995): “The graphic of the control points’ paths in the neighborhood of one or more attractors is called its phase portrait. Phase portraits can be drawn by plotting a behavior value at time t on the Y axis against the value of the same behavior at time t-1 on the X axis.” (ibid 14)

The state space “is the graphic representation of all the possible states” the dependent variables may take on. “It is not quite the same as the Cartesian space, as not all of a Cartesian space may be occupied by the system… Because a dynamical system is one that changes with time, each point in the state space when occupied by the system, has a tendency associated with it for the system to change, which can be represented by a vector. Graphically, this vector appears as an arrow indicating how much each variable will change over the next instant in time. The collection of all such vectors for each point in the state space is called the vector field. …this vectorfield defines the dynamical system. If the system is started at some initial state, the forces creating the vector push the system to a new state, and a succession of states and their vectors create a path, called a trajectory. The graph of the collection of all possible trajectories for all different initial conditions is a phase portrait, another graphic representation of the dynamical system.” (Abraham & Gilgen 1995, 32–33)

An attractor (Guastello ibid.) “is a mathematical structure that describes some types of motion for an object in space, which is generically defined as a vector field. If an attractor structure is present, the object will enter a region of space and not leave it, except under specific conditions. …Attractors come in different varieties, and many of them are anything but motionless over time.” (Guastello 1995, 12–13)

“Attractor is to behavior as a magnet is to iron filings, at least in the case of the simplest attractor dynamics. With fixed-point attractors, a behavior will gravitate toward a steady state or a constant value.” (ibid.)

Attractor (Guastello 1995) is a present manifestation of the future state of a dynamical system. It is the metastable process localized in the environment. It attracts and organizes, shapes a system by hidden forces coming from outside of “that moment” topology of environment (Knyazeva & Kurdyumov 1992). Therefore, attractors are not only the stable moments of phase diagrams (Abraham 1990; 1995) or patterns (Fogel 1993; 2006). They are rather the “real structures in open nonlinear environments, towards which the evolutionary processes of those environments are tended because of transitional processes
attenuation. *Emphasizing* that we are making use of new formation integer – structures-attractors” (Knyazeva & Kurdyumov 1992; emphasis added). Actual structures-attractors “correspond to intentions or goals, and to general development tendencies of nonlinear dynamical systems” (ibid.).

“The range of attractors influence is *basin.*” (Guastello 1995, 12–13)

“Repellor forces have the opposite effect on control points. Objects that get too close to repellor force are ejected from the center to somewhere outside the repellor’s separatrix, which is special name for a repellor’s basin.” (Guastello 1995, 15)

“Saddle points have characteristics of both repellors and attractors. An object is drawn into the saddle, but once it arrives, it is repelled into places unknown. A saddle dynamic can be generated by perturbing the motion of a pendulum. When … [a pendulum] swings a figure-8...

Saddle points are commonly observed in human negotiations or other game theory applications.” (Guastello ibid.)

A *limit cycle* (Guastello 1995) “is an attractor that holds objects in an orbit around the attractor center. …A limit cycle would characterize the path of the moons around a planet, or a planet around a sun. Biological events, such as circadian rhythm … that we observe as a steady oscillation or regular wave pattern over time are, in essence, limit cycles.

…Centripetal behavior is essentially a limit cycle.” (ibid. 14–15)

This sort of attractor was introduced by H. Poincare (Pikovsky et al. 2003, 47).

A *quasi-periodic* attractor “looks like a limit cycle, except that it is perturbed by another limit cycle”. Quasi-periodic oscillators “are interesting in their own right, but they also represent a path toward a chaotic behavior.” (Guastello ibid. 16)

*Chaotic* attractors “are composed of trajectories that do not repeat themselves.” (Guastello 1995, 16)

*Strange attractors* are the particular case of chaotic attractors:

“Lorenz’s discovery of the strange attractor …led [him] … to identify an important and distinctive characteristic of chaotic attractors, *sensitivity to initial conditions, or sensitive dependence.* Small changes in initial values of a variable lead to large differences in the later outcomes.

…The trajectories of *Lorenz attractor* begin as nonrepeating periodic paths on one “mussel shell” of the attractor.” (Guastello 1995, 17–19)
“Systems are stable are unlikely to change in any appreciable way, if at all. An instability implies that a change will take place, that the results are not predictable, and that a particular result is not likely to occur again in repeated experiments. The classical topological definition, due to Andronov and Pontryagin from the 1930s, is that “[A] dynamical system (vector field or map) is structurally stable if nearby systems have qualitatively the same dynamics.” ((Wiggins 1988, 58), cited by Guastello 1995, 22–23)

“Fixed-point attractors are structurally stable, as are limit cycles. Repellors and saddles are unstable. The chaotic attractors, … with the exception of toroidal, are structurally stable also, if we … view the attractor’s basin as a whole.” (ibid 22–23; emphases added)

Bifurcation means “division into two” in the widest sense, and it is used for different qualitative reorganizations or metamorphose of diverse subjects, taking place when control parameters are changing (Arnold 1990, 8). Bifurcation “is a situation, when minor change of parameter point causes significant variation along the trajectory.” (Abraham 1997) “When the bifurcation occurs, the value of a control parameter, that is, a parameter responsible for bifurcations, is called the bifurcation point.” (Abraham & Gilgen 1995, 37)

Subtle bifurcations (necessary for current research) “appear to fall into two broad categories. One involves the transformation of an attractor from one type to another …

All bifurcations share a common trademark, which is the existence of a critical point, or bifurcation point, beyond which the effect of the bifurcation structure begins to take place. The bifurcation point itself is highly unstable” (Guastello 1995, 25). “The location of a bifurcation point in phase space is measured by a control parameter, which, when taken literally, implies a handle by which one might control a dynamical system. The bifurcation point is, thus, a critical value of a control parameter. Control parameters, furthermore, are distinguishable from order parameters. Order parameters represent multiple behavioral outcomes from the same dynamical process” (ibid 26).

Resonance – phases and frequencies (or periods) coincidence in the system with common energy source (Pikovsky et al. 2003, 34–35; 127).

Synchronization – interaction of different systems connected by weak coupling, each having its own energy source, and when the systems oscillate with common phases and frequencies (Pikovsky et al. 2003, 30–46).
## Appendix 2 The table for relationships analyses

<table>
<thead>
<tr>
<th>Phenomenon</th>
<th>Specification and comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. Studied phenomena</strong></td>
<td></td>
</tr>
<tr>
<td>1. Human in field (in actual “life space” (Lewin))</td>
<td></td>
</tr>
<tr>
<td><strong>1. Actual field, facts in field and connections</strong></td>
<td></td>
</tr>
<tr>
<td>1.1. Env. Environment: Situation in general – nature or room space, light, spatial location of activity</td>
<td></td>
</tr>
<tr>
<td>1.1. Obj. Objects: Tools, objects, toys and actual manipulations with them</td>
<td></td>
</tr>
<tr>
<td>1.1. Hum. Human: Human(s) with current spatial location: current gestures, postures, spatial attitudes</td>
<td></td>
</tr>
<tr>
<td><strong>1.2. Self-functioning</strong></td>
<td></td>
</tr>
<tr>
<td>1.2. Exp. Self-experience: nonverbal expressions of individuals’ energy in various manifestations – feelings, emotions, other affects</td>
<td></td>
</tr>
<tr>
<td>1.2. Pers. Self-structure: actual self-concept (personality, current personal position), role (pretend personality) – their verbal utterances and nonverbal expressions;</td>
<td></td>
</tr>
<tr>
<td>1.2. Ch. Self-governing: self-control in relationships and actions – choice-making, decision-making, general metasystemic self-activity</td>
<td></td>
</tr>
<tr>
<td>1.2. Beh. Current behavioral patterns of self</td>
<td></td>
</tr>
<tr>
<td>1.2. Beh. Exp. Spontaneous, new behavior in creative experimenting and creative adjustment</td>
<td></td>
</tr>
<tr>
<td>1.2. Beh. C. Conservative, non-creative adjustment</td>
<td></td>
</tr>
<tr>
<td>1.2. Beh. C. Sf. Approved (stereotypic) own behavior</td>
<td></td>
</tr>
<tr>
<td>1.2. Beh. C. Sys. Joint systems’ previous approved (stereotypic) behavior</td>
<td></td>
</tr>
<tr>
<td><strong>2. Actual Gestalt: actual need, goal or sense of relationship (“The real need” or “quasineed” (Lewin)), entailing (joint) intention</strong></td>
<td></td>
</tr>
<tr>
<td>2. Ph. Urgent physiological need</td>
<td></td>
</tr>
<tr>
<td>2. Ph. Aw. Aware physiological need</td>
<td></td>
</tr>
<tr>
<td>2. Ph. Un. Unaware physiological need affecting</td>
<td></td>
</tr>
<tr>
<td>2. Af. Urgent affective / emotional need or desire</td>
<td></td>
</tr>
<tr>
<td>2. Af. Aw. Aware expression of affective need</td>
<td></td>
</tr>
<tr>
<td>2. Af. Un. Unaware capture by affect</td>
<td></td>
</tr>
<tr>
<td>2. Cg. Cognitively set goal of activity, tensioned (affected) image or dream</td>
<td></td>
</tr>
<tr>
<td>2. Cg. Aw. Aware goal, image or dream</td>
<td></td>
</tr>
<tr>
<td>2. Cg. Un. Unaware capture by goal, image or dream</td>
<td></td>
</tr>
<tr>
<td>2. S. Sense of activity – of play, learning, creativity, etc.</td>
<td></td>
</tr>
<tr>
<td>2. S. Aw. Aware setting a sense of deliberate action or cooperative activity</td>
<td></td>
</tr>
<tr>
<td>2. S. Un. Unaware appeared sense of activity, relationship or play</td>
<td></td>
</tr>
<tr>
<td>2. Abs. Absence of specific need, goal or sense of activity – individual or joint</td>
<td></td>
</tr>
<tr>
<td>2. Abs. Fin. Absence of goal or need as a result of contact completion, finishing of relationships</td>
<td></td>
</tr>
<tr>
<td>2. Abs. Los. Loss of goal or need because of contact interruption – deliberate or not</td>
<td></td>
</tr>
</tbody>
</table>
Phenomena should be followed and made aware to analyze relationship

<table>
<thead>
<tr>
<th>Phenomenon</th>
<th>Specification and comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3. Attention directions, connected to modes of awareness A1-A4</strong></td>
<td></td>
</tr>
<tr>
<td>Att.A1</td>
<td>Attention to inside-self affective phenomena: attention captured by self-experiences (feelings, emotions, intentions, volitions, intuition, etc.)</td>
</tr>
<tr>
<td>Att.A1.Aw</td>
<td>Aware attention to actual self-experiencing</td>
</tr>
<tr>
<td>Att.A1.Un</td>
<td>Unaware affects, attention being captured by unaware experiences</td>
</tr>
<tr>
<td>Att.A2</td>
<td>Attention to cognitive self-domain (attention, captured by dreaming, thinking, conceptualizing, planning, fantasizing)</td>
</tr>
<tr>
<td>Att.A2.Aw</td>
<td>Aware attention to self-concept, role (pretend personality), dreaming, planning, etc.</td>
</tr>
<tr>
<td>Att.A2.Un</td>
<td>Unaware capture by self-concept, role (pretend personality), dreaming, planning, etc.</td>
</tr>
<tr>
<td>Att.Beh</td>
<td>Involvement into behavior (attention captured by motor activity)</td>
</tr>
<tr>
<td>Att.Beh.Aw</td>
<td>Aware attention to self-behavior flow of actual contact with field</td>
</tr>
<tr>
<td>Att.Beh.Un</td>
<td>Unaware capture by behavior flow in current field</td>
</tr>
<tr>
<td>Attention to relationships’ field – objects and others (attention captured by inside of relationships but external for self field)</td>
<td></td>
</tr>
<tr>
<td>Att.A3</td>
<td>Attention to object(s)</td>
</tr>
<tr>
<td>Att.A3.Aw</td>
<td>Aware attention to present objects</td>
</tr>
<tr>
<td>Att.A3.Un</td>
<td>Unaware attention to objects, being captured by them</td>
</tr>
<tr>
<td>Att.A4</td>
<td>Attention to other(s)</td>
</tr>
<tr>
<td>Att.A4.Aw</td>
<td>Aware attention to other(s)</td>
</tr>
<tr>
<td>Att.A4.Un</td>
<td>Unaware attention to other(s), being captured by their presence</td>
</tr>
<tr>
<td>Att.RFl</td>
<td>Attention to relationships flow features themselves</td>
</tr>
<tr>
<td>Att.RFl.Aw</td>
<td>Aware attention to relationships flow</td>
</tr>
<tr>
<td>Att.RFl.Un</td>
<td>Unaware attention to relationships, being captured by them</td>
</tr>
<tr>
<td>Att.Circ</td>
<td>Attention circulation – preferred combinations of attention direction, or ordered attention circulation between self, fantasy and environment (Att.A1A2; Att.A2A3; Att.A1A3; Att.A1A2A3)</td>
</tr>
<tr>
<td>Att.Circ.Aw</td>
<td>Aware attention circulation, ordered in purpose to be aware of attention</td>
</tr>
<tr>
<td>Att.Circ.Un</td>
<td>Disordered, even chaotic unaware attention circulation (attention directions’ disordered alternation)</td>
</tr>
<tr>
<td>Att.Non</td>
<td>Attention withdrawing from relationships, no specific direction can be registered in relationships field</td>
</tr>
</tbody>
</table>

| **4. Mode of activity on contact boundary: relationships phases and current intentions (“the quasi-needs” (Lewin)) alternation: between individual and field (1), and between interlocutors (2)** |
| Ph.1 | Phases before first qualitative change of relationships system, responsible for further system arrangement and sense (goal, need) awareness |
| Ph.A1 | Sensation of organism-in-the-field, first sensory-motoric orientation in situation, awakening of self-experience |
| Ph.A2 | Sensation of the single organism-in-the-field, sensation of other (learning to see and to hear the other), attention to other as to novelty source |
| Ph.B1 | Attention to novelty, awakening of self-structure |
| Ph.B2 | Mutual awareness – mutual attunement of partners, negotiations to elaborate a common ground |
| Ph.C1 | Awareness of a novelty – a figure appearance |
| Ph.C2 | Negotiations on roles (positions), interests to elaborate a shared sense |
Phenomena should be followed and made aware to analyze relationship

<table>
<thead>
<tr>
<th>Phenomenon</th>
<th>Specification and comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.2. Relationships systems’ fist dynamical shift – systems’ activity mode awareness and activity development phases</td>
<td></td>
</tr>
<tr>
<td>Ph.D1</td>
<td>Making a choice to gain the need, goal, sense – joint intention appearance</td>
</tr>
<tr>
<td>Ph.D2</td>
<td>Arousal of a shared sense of relationships, resulting in joint intention and joint activity in joint system</td>
</tr>
<tr>
<td>Ph.E1</td>
<td>Scanning the field in search of a new way of action – current intention appearance</td>
</tr>
<tr>
<td>Ph.E2</td>
<td>Negotiations and Mutual Attunement in order to realize shared sense in coordinated activity</td>
</tr>
<tr>
<td>Ph.F1</td>
<td>Trials of new modes of action</td>
</tr>
<tr>
<td>Ph.F2</td>
<td>Cooperative activity trials – mutual coordination and attunment in action</td>
</tr>
<tr>
<td>Ph.3. Relationships systems’ second dynamical shift – systems transition to irreversible restructuring</td>
<td></td>
</tr>
<tr>
<td>Ph.G1</td>
<td>Attunement in action – starting of active creative adjustment to novelty</td>
</tr>
<tr>
<td>Ph.G2</td>
<td>Rising a sense of commonality, and a joint system energy / action in cooperative activity</td>
</tr>
<tr>
<td>Ph.H1</td>
<td>Involvement into relationship; flow (resonance) of new interaction with environment, self-structuring</td>
</tr>
<tr>
<td>Ph.H2</td>
<td>Flow of relationships-and-activity, implying continuous mutual attunement in action</td>
</tr>
<tr>
<td>Ph.4. Withdraw from relationships inside oneself</td>
<td></td>
</tr>
<tr>
<td>Ph.I1</td>
<td>Withdrawal from environment, individual assimilation of relationship results; sometimes – learning trials</td>
</tr>
<tr>
<td>Ph.I2</td>
<td>Withdrawal from joint activity, individual assimilation of relationship results; sometimes – learning trials</td>
</tr>
</tbody>
</table>

5. Deliberate regulation of relationships on contact boundary

| 5.AF. Attitude to field objects | 5.AF.F. Adjustment to current field objects                                      |
| 5.AF.Ind. Indifference to environment, no use of objects | 5.AF.B. Reconstructing field objects for current self-needs and adjusting them to self-boundary |

| 5.AO. Attitude to other | 5.AO.A. Attunement to other, tendency to perceive other as he/she is     |
| 5.AO.M. Mutual attunement of proposals and acts | 5.AO.D. Detune with other, tendency to isolate from other |
| 5.AO.Cnf. Tendency to confront to other | 5.AO.C. Tendency to control other, organize his/her (their) activity for purposes of one-self |

| 5.PL. Presence level of investigated / student, child clients’ self related to other investigated self | 5.PL.E. Expressiveness |
| 5.PL.Lower. Lower | 5.PL.E. Lower. Lower |
| 5.PL.E.E. Equal | 5.PL.E.H. Higher |
| 5.PL.A. Lower | 5.PL.A. Lower. Lower |
| 5.PL.A.E. Equal | 5.PL.A.H. Higher |

| 5.CL. Conversation levels (or levels of presence) | 5.CL.F. Formal |
| 5.CL.C. Contact | 5.CL.S. Standard |
| 5.CL.CO. Critical occasions | 5.CL.In. Intimacy |
## Phenomena should be followed and made aware to analyze relationship

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>3. Contact interruptions (self-energy dissipation modes)</strong></td>
<td></td>
</tr>
<tr>
<td>6.C. Confluence – a boundary discerning dysfunction</td>
<td></td>
</tr>
<tr>
<td>6.C.1. Confluence with the need – absence of clear boundary between need and current self-structure</td>
<td></td>
</tr>
<tr>
<td>6.C.2. Confluence with the other – absent or unaware boundary between relationship participants</td>
<td></td>
</tr>
<tr>
<td>6.Int. Introjection – alien installations, stereotypes, energy dissipations through damaging a self-boundary</td>
<td></td>
</tr>
<tr>
<td>6.Pr. Projection – widening of self-boundaries to world and others, unaware attribution of unproved assertions to others and world, dissipating energy outside of self</td>
<td></td>
</tr>
<tr>
<td>6.Pr.M. Mirror projection – attributing self-qualities, thoughts, feelings, or those desirable for one-self to others</td>
<td></td>
</tr>
<tr>
<td>6.Pr.Cat. Catharsis projection – attributing to others rejected present self-qualities, thoughts, needs, thus “liberating” from them by fantastic catharsis</td>
<td></td>
</tr>
<tr>
<td>6.Pr.Com. Complementary projection – attributing to others qualities, urgent in current situation but absent</td>
<td></td>
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<tr>
<td>6.Pr.Cr. Creative projection – attributing to self or to others a qualities, which come true after research / experimentation</td>
<td></td>
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<tr>
<td>6.Pr.S. Self-projection – attributing to oneself desirable qualities, whether possessing or not</td>
<td></td>
</tr>
<tr>
<td>6.Ret. Retroflection – change of activity energy’s direction towards self-structure (inner dissipation) in spite of directing it to dissipative structures of field (environment)</td>
<td></td>
</tr>
<tr>
<td>6.Eg. Egotism – use of self-energy to close boundary in order to keep current personality or position, to isolate oneself from field dissipative structure</td>
<td></td>
</tr>
<tr>
<td>6.Def. Deflection – change of environmental activity energy direction, energy dissipation into alien objects</td>
<td></td>
</tr>
<tr>
<td><strong>II. Researcher / helper / teacher phenomena</strong></td>
<td></td>
</tr>
<tr>
<td>7. Researchers / helpers / teachers interventions</td>
<td></td>
</tr>
<tr>
<td>7.P. Presence level constituents, related to investigated / student, child / client</td>
<td></td>
</tr>
<tr>
<td>7.P.E. Expressiveness</td>
<td></td>
</tr>
<tr>
<td>7.P.E.L. Lower</td>
<td></td>
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<tr>
<td>7.P.E.Idm. Idem</td>
<td></td>
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<tr>
<td>7.P.E.H. Higher</td>
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<tr>
<td>7.A. Accessibility</td>
<td></td>
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<tr>
<td>7.A.L. Lower</td>
<td></td>
</tr>
<tr>
<td>7.A.Idm. Idem</td>
<td></td>
</tr>
<tr>
<td>7.A.H. Higher</td>
<td></td>
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<tr>
<td>7.Ip-I. Interpersonal influence – verbal and nonverbal – through feelings, ideas, words, acts</td>
<td></td>
</tr>
<tr>
<td>7.Ip-I.W. Withdrawing</td>
<td></td>
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<tr>
<td>7.Ip-I.N. Non-intervening</td>
<td></td>
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<tr>
<td>7.Ip-I.L. Listening</td>
<td></td>
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<tr>
<td>7.Ip-I.CA. Calling attention and querying</td>
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<tr>
<td>7.Ip-I.G. Guiding</td>
<td></td>
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<tr>
<td>7.Ip-I.Exp. Proposing safety experimenting</td>
<td></td>
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<tr>
<td>7.Ip-I.I. Instructing</td>
<td></td>
</tr>
<tr>
<td>7.ToP. Topical paralleling</td>
<td></td>
</tr>
<tr>
<td>7.ToP.St. Staying with the same topic</td>
<td></td>
</tr>
<tr>
<td>7.ToP.Log. Logical development of topic</td>
<td></td>
</tr>
<tr>
<td>7.ToP.Div. Diverging from preceding response topic</td>
<td></td>
</tr>
<tr>
<td>7.ToP.Ch. Definitely changing the subject</td>
<td></td>
</tr>
<tr>
<td>7.FrP. Frame paralleling – forming a different focus on topic, varying a connection between topic and its’ current context</td>
<td></td>
</tr>
<tr>
<td>7.FrP.N. Narrowing a topic</td>
<td></td>
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<tr>
<td>7.FrP.P. Paralleling a topic</td>
<td></td>
</tr>
<tr>
<td>7.FrP.B. Broadening a topic</td>
<td></td>
</tr>
<tr>
<td>7.FeP. Feeling paralleling – researcher / helper/ teachers attention extent to feelings of interlocutor, compared to</td>
<td></td>
</tr>
<tr>
<td>7.FeP.L. Lower attention extent than of investigated / student, child / clients’ attention to his/her own feelings</td>
<td></td>
</tr>
<tr>
<td>7.FeP.S. The same extent of attention</td>
<td></td>
</tr>
<tr>
<td>Phenomenon</td>
<td>Specification and comments</td>
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<tr>
<td>------------</td>
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<tr>
<td>Phenomena should be followed and made aware to analyze relationship</td>
<td></td>
</tr>
<tr>
<td><strong>Attention to interlocutors’ self-feelings</strong></td>
<td>F. FeP.H. Higher attention extent</td>
</tr>
<tr>
<td>7. LoA. Locus of attention paralleling – attention extent to investigated / student, child / clients’ subjectivity</td>
<td>F. LoA.S. Attention to subjective reality of investigated / student, child / client</td>
</tr>
<tr>
<td>7. LoA.S. Ex: Experiences</td>
<td>7. LoA.S. Th: Thoughts</td>
</tr>
<tr>
<td>7. LoA.I-I. Attention on relationship flux between studied couple or group members / students, children / clients</td>
<td></td>
</tr>
<tr>
<td>7. LoA.I-R. Attention on relationships between investigated / student, child / client and researcher / helper / teacher</td>
<td></td>
</tr>
<tr>
<td>7. LoA.R. Attention on researcher / helper / teachers’ own subjective reality</td>
<td></td>
</tr>
<tr>
<td>7. LoA.R. Ex: Experiences</td>
<td>7. LoA.R. Th: Thoughts</td>
</tr>
<tr>
<td>8. Researcher / helper / Teachers’ attitudes towards investigated / student, child / clients</td>
<td></td>
</tr>
<tr>
<td>8.E. Expectations from investigated / student, child / client</td>
<td>8. Ex.Ch. Charged specific expectations</td>
</tr>
<tr>
<td>8.R. Responsibility in relationships organizing and position</td>
<td>8.R.H. High responsibility, often interventions and central position</td>
</tr>
<tr>
<td>8.R.Eq. Equal responsibility with investigated, equal position</td>
<td>8.R.L. Low responsibility, alienated position</td>
</tr>
<tr>
<td><strong>III. Effects / results of interventions</strong></td>
<td></td>
</tr>
<tr>
<td>9. ESA. Effects on awareness of self</td>
<td>9. ESA.W. Widening awareness</td>
</tr>
<tr>
<td>9. ESA.N. Narrowing awareness</td>
<td></td>
</tr>
<tr>
<td><strong>10. Effects of interventions on relationships process flux</strong></td>
<td></td>
</tr>
<tr>
<td>10. ER. Effects on resistances of self</td>
<td>10. ER.R. Reconstructing resistance (defense)</td>
</tr>
<tr>
<td>10. ER.A. Actualizing resistance (defense)</td>
<td>10. EE. Effects on energy of relationship</td>
</tr>
<tr>
<td>10. EE.Fs. Changing energy to facilitate relationship</td>
<td>10. EE.Fr. Changing energy to frustrate relationship</td>
</tr>
<tr>
<td>10. EA. Influences on adjustment mode in current relationship</td>
<td>10. EA.A. Rising of mutual attunement in relationship</td>
</tr>
<tr>
<td>10. EA.K. Keeping, facilitating current attunement</td>
<td>10. EA.De. Detune of relationship</td>
</tr>
<tr>
<td>10. ERC. Effects on relationship completion</td>
<td>10. ERC.C. Maintenance of relationship completion</td>
</tr>
<tr>
<td>10. ERC.I. Remain incomplete relationship</td>
<td>10. ETC. Effects on topic completion</td>
</tr>
<tr>
<td>10. ETC.C. Maintenance of topic completion</td>
<td>10. ETC.I. Remain incomplete topic</td>
</tr>
</tbody>
</table>
Comments to the table for the relationship analyses

The background for the table is arranged from the Gestalt approach (Ginger & Ginger 1999; Lebedeva & Ivanova 2004), combined with a humanistic-existential approach to relationships (Bugental 1987), and seen from a nonlinear way of thinking.

*Items 1 & 2* are taken from the theory of self in Gestalt approach (Ginger & Ginger 1999, 117–121; Lebedeva & Ivanova 2004, 121–221).

Attention directions (*item 3*) are taken from K. Jaspers’ notions about consciousness and attention (1963), and they are in good agreement with the theory of self in Gestalt approach and with awareness dynamics by J. Zinker (1994). Modes of attention in *item 3* are connected to modes of awareness elaborated in this research.

Phase dynamics in *item 4* are elaborated on the basis of phase sequences of Gestalt approach (Zinker 1977; 1994; Clarkson 1989) and phase sequences developed in this research.

Deliberate regulation of relationships on contact boundary (*item 5*) was worked out using the Saint-Petersburg Gestalt Institute’s elaborations (Lebedeva & Ivanova 2004, 337–438) involving a humanistic-existential view of therapeutic alliance (Bugental 1987).

*Item 6* combines classic Gestalt view of resistances (Perls 1969b; 1973; Perls *et al.* 1951 (1980); Zinker 1994) and nonlinear notions of contact boundary as a dissipative structure.

*Item 7* contains Gestalt approach and humanistic-existential conceptions of influence (Lebedeva & Ivanova 2004; Bugental 1987), fit for modelling a self-sustained system’s behavior.

*Item 8* is based on J. Enright’s (1970; 1980) view on therapeutic position in Gestalt approach.

*Items 9 & 10* are elaborated from Gestalt tradition of professional supervision, and professional position of a helper (Enright 1970; Zinker 1977; Lebedeva & Ivanova 2004).

All the items are formulated using the professional experience of the author of this research as a Pedagogical University teacher, Educational psychologist, and Gestalt Practitioner.

Use of the table for relationship analyses, in our view, should be done after appropriate instruction by skilled helper to elaborate the corresponding individual position, the phenomenological view on relationship flow and intervention skills.
93. Leinonen, Piritta (2007) Interpersonal evaluation of knowledge in distributed team collaboration
96. Heiskanen, Eija (2007) Täydennyskoulutus kainuulaisten opettajien käsitysten valossa
Ildar Safarov

TOWARDS MODELLING OF HUMAN RELATIONSHIPS

NONLINEAR DYNAMICAL SYSTEMS IN RELATIONSHIPS