Research Article

Human Recognition-Behavioural Adaptation System Analyzed via Structuralism and Systems Theory

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Structuralism analyzes underlying structural patterns of human recognition-behaviors. Systems theory is a transdisciplinary study of a meta-model system integrating interrelated and interdependent functional single-models. The human recognition-behavioral adaptation system maintains the homeostasis of Human Intelligence, the recognition-behavioral SELF, and the recognition-behavioral WORLD. The recognition-behavioral adaptation system was systematically analyzed with the methodologies of Structuralism and Systems theory in the present study. The recognition-behavioral adaptation system of Human Intelligence was analogized from the substance-metabolism system. Human Intelligence was considered to be the language-metabolism system working via the modeling-codes formed in the Neuronal Network empirically. Human thinking patterns are induced via the modeling-codes; however, Human Intelligence economically and stubbornly uses the modeling-codes. The recognition-behavioral adaptation system of the SELF was considered to be the meta-model system complex-networking the functional single-models defined in the neurological and the psychological frames. The meta-model system maintains homeostasis via the cybernetic feedback system involved in the single-model circuits. The Intelligence-module, the core of Human Intelligence, constructs the WORLD by developing the SELF. The recognition-behavioral adaptation system of the Intelligence-module was considered to be the self-reference system distinguishing the selfness and the otherness, like the immune system. The Intelligence-module copes with neurological and psychological stresses shaking the homeostasis of the WORLD with the cybernetic feedback system and the self-reference system. Finally, it was comprehended that the human recognition-behavioral adaptation system is a language modeling system to maintain homeostasis by emergently working like the other biological systems.

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1. Introduction

Human beings maintain homeostasis via biological adaptation systems. The human recognition-behavioral adaptation system has been studied in Human Intelligence, recognition-behavioral SELF, and recognition-behavioral WORLD. Structuralism is a transdisciplinary study that analyzes underlying structural patterns of human recognition-behaviors by reducing the recognition-behaviors to models, and it has developed in Semiology, Anthropology, and Psychology. Systems theory is a transdisciplinary study that analyzes the meta-system integrating the interrelated and interdependent single-models, and it has developed in Physiology, Biology, and Ecology. The scientific procedure is a syllogistic system to organize properties of the thinking target into testable models under the thinking frame analogized from the first principle. In the present study, the nature of Human Intelligence, the development of recognition-behavioral SELF, and the structure of recognition-behavioral WORLD are analyzed to reveal the whole picture of the human recognition-behavioral adaptation system via the methodologies of Structuralism and Systems theory.

2. Nature of Human Intelligence

2.1. Principle of Human Intelligence

An organism maintains homeostasis by performing adaptations corresponding to the circumstances. Substance metabolism is a modeling-system that performs physical adaptation. Foreign macro-molecules/proteins are catabolized to micro-molecules/amino-acids. Cells intake the necessary micro-molecules via transporters of the bio-membrane, and they synthesize inner macro-molecules via metabolic enzymes of the bio-membrane. Both the transporters and the enzymes are expressed corresponding to the codes mounted in the genome, and the validity of the synthesized inner macro-molecule has been empirically decided via enormous trial and error. This is the principle of physical adaptation. Human Intelligence is a modeling-system that performs recognition-behavioral adaptation. Human Intelligence abstracts words/signs of single-properties coming from the thinking target, and it integrates the single-properties to meaningful terms/formulas of single-models corresponding to the modeling-codes formed in the brain empirically. The single-models are also hyper-ordered to meaningful meta-models of concepts corresponding to the modeling-codes that

have been transferred via the philosophies cultured in the societies[1]. Namely, Human Intelligence is the recognition-behavioral modeling-system performing language metabolism under the principle of the modeling-codes.

2.2. Nature of Human Intelligence

Animals operatively abstract circumstantial information and replace the information with a meaningful signal via the first signaling system of Conditioning-reflection. Human Intelligence is the second signaling system that integrates the signals into terms/figures of natural language and formulas/graphs of mathematics via learning and experiences. The second signaling system is followed by qualitative reasoning of Induction and quantitative reasoning of Deduction. Analogy is an inductive inference of homology and simplification to treat analogues having qualitative connotation. Algorism is a deductive inference of operation to treat digitals having quantitative connotation. Pattern recognition is an inductive/deductive inference of clustering to exchange analogues and digitals. The terms/formulas are formed corresponding to the single-modeling-codes of causality and resemblance coming from Analogy and Pattern recognition, and the formulas/graphs are formed corresponding to the single-modeling-codes of Set and Map coming from Analogy and Pattern recognition. Logic is the study of correctly reasoning about language representations. The formal logic examines the compatibility of the proposition represented with mathematical symbols, and the informal logic examines the reproducibility of the discourse represented with natural language. Now, Artificial Intelligence (AI) was constructed for simulating Human Intelligence. AI is defined as a vertical algorism unit which consists of artificial neurons, artificial synapses, and artificial weights for information stream, and the components function similarly to those of a Neuronal Network. AI of Deep Neural Network (DNN) has multiple layers between the input and output layers, and it is trained on the Algorism via multiple times of vertical information transverse between the input and output layers. AI of Recurrent Neural Networks (RNNs), in which data can flow in a horizontal direction, is used for language modeling followed by Machine Reading Catalog (MRC), which performs clustering like human Pattern recognition. AI of Generative Pre-trained Transformer (GPT) works as a language generator followed by a Corpus of sentence model catalogue provided with human Analogy. Namely, AI does not have the inference standard for compiling data, and it solely performs the quantitative reasoning by bit-calculating corresponding to the logical modeling-codes installed in the artificial Neuronal Network beforehand. On the other hand, Human Intelligence has originally the inference

standard for editing data, and it performs the qualitative/quantitative reasoning corresponding to the modeling-codes formed in the Neuronal Network empirically.

2.3. Performance of Human Intelligence

Human Intelligence is the language modeling system that maintains the recognition-behavioral homeostasis under the principle of the modeling codes like the substance metabolism system. The language modeling system is performed under the intuitive thinking frame of the first principle introduced by Analogy. Briefs come from an empirical single model of causality, and hypotheses are briefs whose validity ought to be assessed via scientific procedure coming from syllogistic inference of Analogy, Pattern-recognition, and Algorism. Nevertheless, Human Intelligence persists in a previously successful brief, and it easily accepts Pre-established Harmony of the previously successful hypothesis. The term Occam's razor indicates an algorism procedure to select a valid hypothesis from the feasible hypotheses. Human Intelligence performs the algorism procedure not with the exhaustive search manner of AI but with empirical guesswork manner. In short, Human Intelligence performs the qualitative/quantitative reasoning with an economical and stubborn manner. The reasoning manner induces Selection bias and Cognitive dissonance. The recognition distortions might lead earnest researchers into Pseudoscience that assesses the validity of the hypothesis by putting in ad-hoc hypotheses, and/or into Fanaticism that verifies the compatibility by premising the super natures. Déjà vu has been observed in a recognition situation which was previously learned and experienced. The first principle is induced via the Déjà vu mechanism. Philosophical researchers should be conscious of the economy and stubbornness of the language modeling system[2]; nevertheless, previous psychiatric researchers might miss the disease nature by adhering to the phenomenological distinguishment. Now, the recognition-behavioral modeling codes are represented as symbolic figures shared in philosophies of different cultures. Meta-modeling code describing the opposite but interconnected forces is represented like the Yin-Yang Taiji of Chinese philosophy, and meta-modeling code complex-networking single models comes from Wu Xing of Chinese medicine. Meta-modeling code of causality-sequence diagram is represented like the Sefirot (tree of life) of Kabbalah, and Meta-modeling code of syllogism is represented like the Trimurti (trinity of supreme divinity) of Hinduism. Mandala of Buddhism symbolizes centroid-hierarchy meta-modeling code of the spiritual world, and Mount Meru of Indian world-idea symbolizes ascending nest-hierarchy meta-modeling code of transcendent spirit-evolution. Meme is a term/figure inspired by the cultural connotation, and

it works like Gestalt. Narratives of the world-view have been produced corresponding to the meta-modeling codes. Myths and philosophical ideas are prototypes of the narratives re-told by using the memes of those days, and present creators re-arrange the myths and the philosophical ideas by incorporating currently popular memes.

3. Development of Recognition-Behavioral Self

3.1. Nature of Human SELF

Physical SELF, which is defined in a physiological frame, is represented as a meta-system complex-networking single models of organs, and it maintains the physical homeostasis via the self-regulation system involved in the meta-system. Recognition-behavioral SELF, which is defined in the recognition-behavioral frame, is also represented as a meta-system complex-networking single models of the functional modules, and the SELF maintains the recognition-behavioral homeostasis via the cybernetic feedback system involved in the module circuits. Network structure of the meta-system emergently shifts adaptation standard of the SELF corresponding to the circumstance, and reality of the SELF is holistically explained by topologically figuring the network structure.

3.2. Neurological SELF

Neuroscientific studies have reported that the mammalian brain works mainly via a complex network of adrenergic neuronal, serotonergic neuronal, cholinergic neuronal, and dopaminergic neuronal modules, the activities of which are followed by humoral glycolipids[3][4][5][6]. The neuronal module is a single model performing neurological information processing, and the neurological SELF is the meta-system complex-networking the single models defined in the neurological frame. The neurological SELF works to maintain neurological adaptation. The cholinergic neuronal module (C-module) preserves stress-coping memories, the adrenergic neuronal module (A-module) induces stress-coping behaviors, and the serotonergic neuronal module (S-module) keeps physical strength for stress-coping. The dopaminergic neuronal module (D-module) is the point of the cybernetic feedback system for integrating these module functions, and it is placed in the centroid of the CAS triangle, distinguished as the Adaptation-centroid because of its integration role. D-(C-A-S) of the neurological SELF is covered by the Self-membrane. The structure of the SELF comes from the complex-networking meta-modeling code of Wu Xing and the centroid-hierarchy meta-modeling

code of Mandala (Figure 1). The modules are responsible for neurological symptoms. The S-module is responsible for Fatigue/Depression, and the C-module is responsible for Anxiety, resulting in Panic disorder. The A-module is responsible for Obsession/Compulsion; furthermore, the A-module setting on the flight induces Dissociation/Conversion, and the A-module setting on the fight induces Aggression. The D-module induces self-injuring for getting the prompt dopaminergic satisfaction. The A-C-D circuit involves the cybernetic feedback system to control conditionings, the C-S-D circuit involves the cybernetic feedback system to control emotional behaviors, the S-A-D circuit involves the cybernetic feedback system to control instinctive behaviors, and the D-(C-A-S) circuit involves the cybernetic feedback system to induce voluntary learning for gaining successful stress-coping. The D-module, the core of the feedback systems, assesses the successful stress-coping as an increase in dopaminergic neuronal activity. The D-module also integrates the Autonomic nerve system of the sympathetic nerve system and the para-sympathetic nerve system, and a dysfunctional D-module induces autonomic dystonia. The modeling code of the D-module is represented like the symbolical figure of Yin-Yang Taiji (Figure 2).

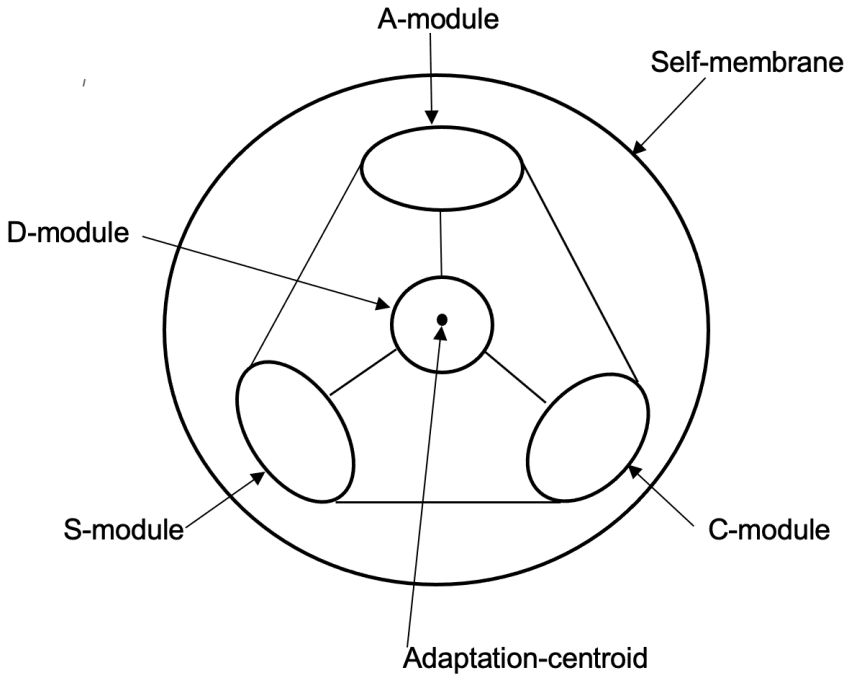

Figure 1. Neurological SELF. Neurological SELF is constructed as a complex network of the cholinergic module (C-module), adrenergic module (A-module), serotonergic module (S-module), and dopaminergic module (D-module). The C-module preserves the stress-coping memories, the A-module induces the stress-coping behaviors, the S-module keeps the physical strength, and the D-module integrates these module functions. The D-module is placed at the Adaptation-centroid of the CAS triangle because of its role in maintaining adaptation integrity.

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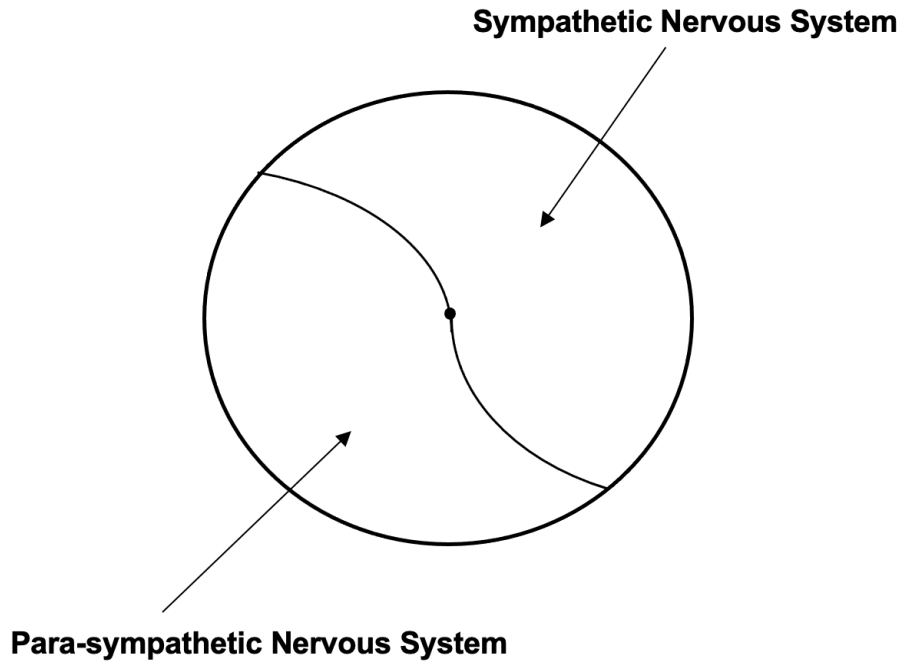

Figure 2. Modeling code of D-module. The D-module also functions as the Autonomic nerve system, integrating the sympathetic nerve system and the para-sympathetic nerve system. The modeling code of the D-module has been transmitted as the symbolical figure of Yin-Yang Taiji, coming from Chinese philosophy.

3.3. Neuro-psychiatric SELF

Neurological SELF develops into neuro-psychiatric SELF for maintaining the neuro-psychiatric adaptation. The C-module and A-module of neurological SELF are united to form the *Sensitivity-module*, the A-module and S-module are united to form the Behavior-module, and the S-module and C-module are united to form the Sympathy-module. The Intelligence-module, placed at the Adaptation-centroid, involves the cybernetic feedback system for integrating the module functions (Figure 3). The Intelligence-module has evolved from the D-module by acquiring language usage, and it performs syllogistic inferences of the scientific procedure for verifying the dopaminergic recognition-behavioral compatibility via the involved cybernetic feedback system. The modeling code is represented as a symbolical figure of Trimurti (Figure 4). Activities of the modules are customized not only via genetic factors but also via acquired learning and experiences. The Behavior-module, controlling social fight or flight, is responsible for Hyperactivity and Inattention in Attention-Deficit

Hyper-Activity Disorder (ADHD)[7]. The Sympathy-module, working for communication, is responsible for Autism-Spectrum Disorder (ASD), and the Sensitivity-module, controlling the input of stress information, is responsible for Exceed Stimulation-amplify of ASD[8]. The Intelligence-module is responsible for Intellectual Disabilities and Selective Learning Disability[9]. Symptoms of a neuro-psychiatric disease, such as Bipolar disorder, are explained via the meta-model system. The patients first show Exceed Stimulation-amplify coming from hypersensitivity of the Sensitivity-module. The Exceed Stimulation-amplify is not comfortable. The patients are required to do fight or flight to decrease the discomfort. Failure of the fight results in Depression, and failure of the flight results in Abuses of substances, love affairs, eating, and self-injury, which induce quick and temporary dopaminergic pleasure by stimulating the Intelligence-module. The patients who are exposed to serious discomfort might try to commit suicide via Agitation coming from the Behavior-module, and the patients who are tormented by Anxiety with an unknown origin would represent Hallucination and Delusion to explain the origin of Anxiety compatibly. The dysfunctional Intelligence-module also induces autonomic dystonia with Depression.

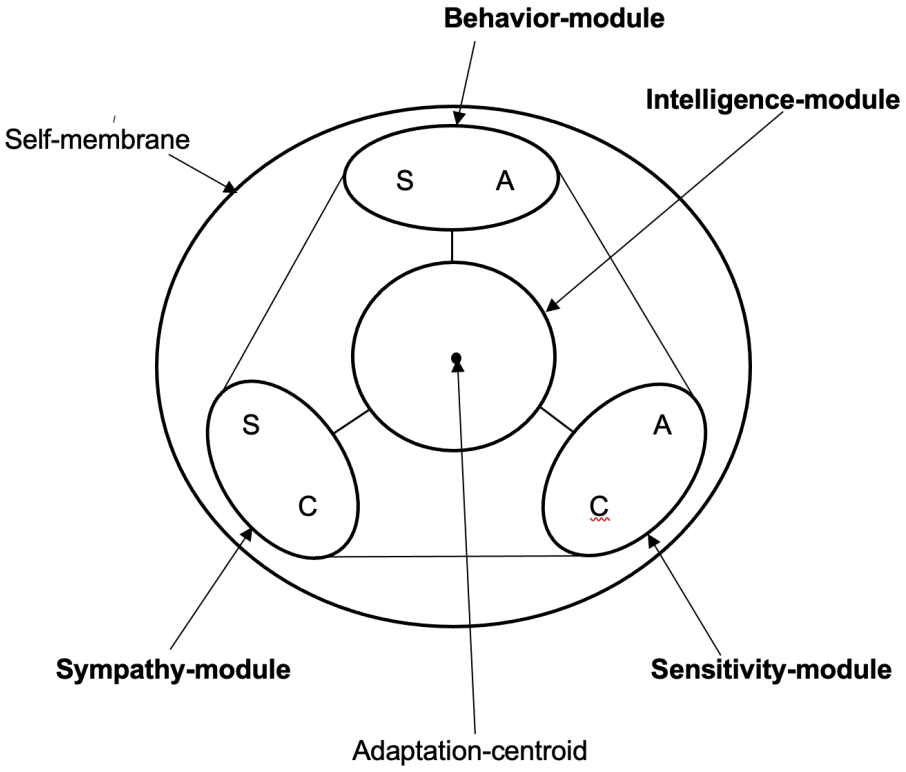

Figure 3. Neuro-psychiatric SELF. The S-module and A-module of neurological SELF are integrated to form the Behavior-module. The Behavior-module is responsible for the social behaviors arranged via the conditionings. The A-module and the C-module are integrated to form the Sensitivity-module. The Sensitivity-module is responsible for the sensitivity of the memorized stresses. The C-module and the S-module are united to form the Sympathy-module. The Sympathy-module is responsible for the allies-recognition of the social situation. The Intelligence-module, placed at the Adaptation-centroid, involves the feedback system integrating the module functions.

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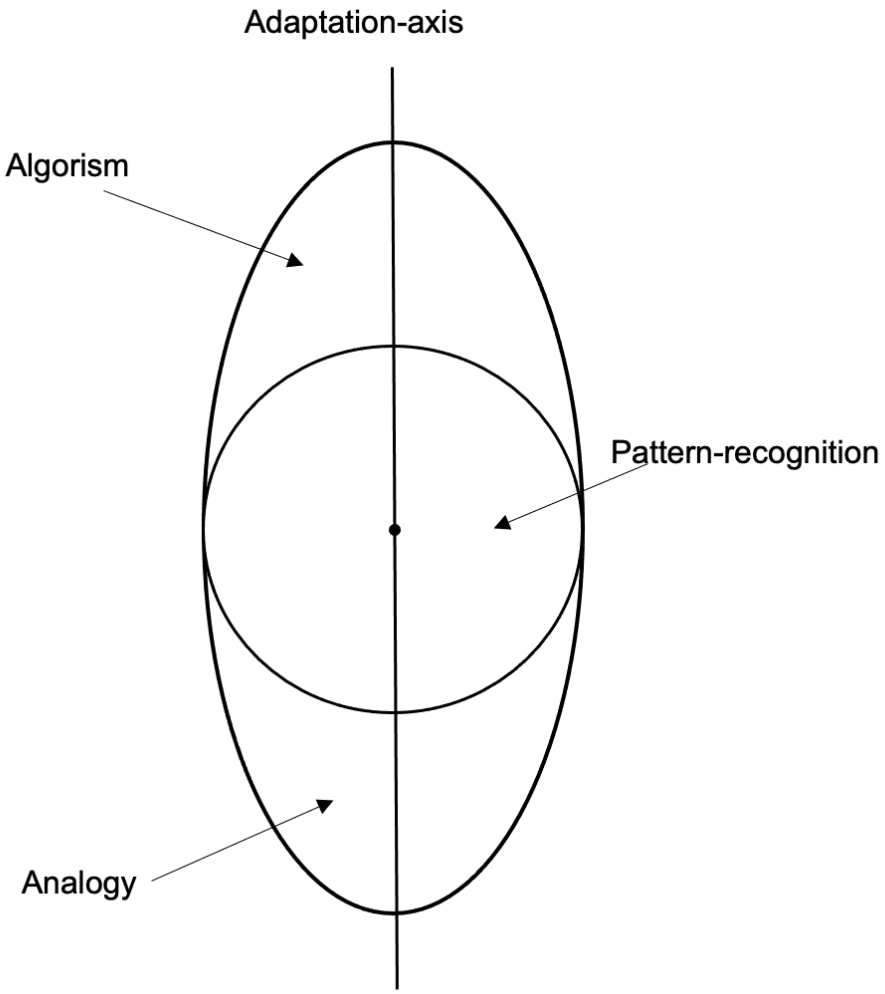

Figure 4. Intelligence-module evolving from D-module. The Intelligence-module, which evolves from the D-module of neurological SELF corresponding to the acquirement of language operation, performs syllogistic inferences of the scientific procedure. The modeling code is represented as a symbolical figure of Trimurti (the trinity of supreme divinity) of Hinduism.

3.4. Psychological SELFs

Human constructs societies of families, communities, and nations for collectively satisfying desires for living, and the societies have decided rules and roles which the members are requested to obey for maintaining social homeostasis. Namely, human society is the circumstance in which the human SELF

is requested to maintain homeostasis, and the reality of adaptation has been studied in Psychology. The neuro-psychiatric SELF, defined in the psychological frame, develops into the personality-psychological SELF and the socio-psychological SELF. Previously, the personality-psychological SELF was analyzed by emphasizing the structure of the functioning modules. The structure was represented as a 2-dimensional vector space, and the adaptation strategy of the SELF was holistically explained[10]. The socio-psychological SELF has a Sex-module, a Finance-module, and an Honor-module corresponding to the social desires. The Sex-module, coming from the Sympathy-module of the neuro-psychiatric SELF, is responsible for the sexual charm relating to reproduction. The Finance-module, coming from the Sensitivity-module, is responsible for financial power, and the Honor-module, coming from the Behavior-module, is responsible for the social hierarchy. The Intelligence-module is placed in the Adaptation-centroid of the modules-triangle (Figure 5). Societies estimate the activities of the Sex-module, the Finance-module, and the Honor-module corresponding to social standards. The positive estimation induces compatible social acceptance of the SELF, but the negative estimation gives social selection pressure to the SELF. The Intelligence-module of the SELF has been requested to involve a self-reference system maturing by incorporating the social standards. Individuals whose Intelligence-module successfully incorporates the social standards would participate in society with an innovative or conservative attitude. On the other hand, individuals whose Intelligence-module fails to incorporate the social standards might retreat from society like a recluse, or might use sophistry for maintaining compatibility with social adaptation. In any case, the Intelligence-module that does not satisfy the desire for social recognition falls the SELF into an Adjustment disorder accompanied by an Anxiety disorder.

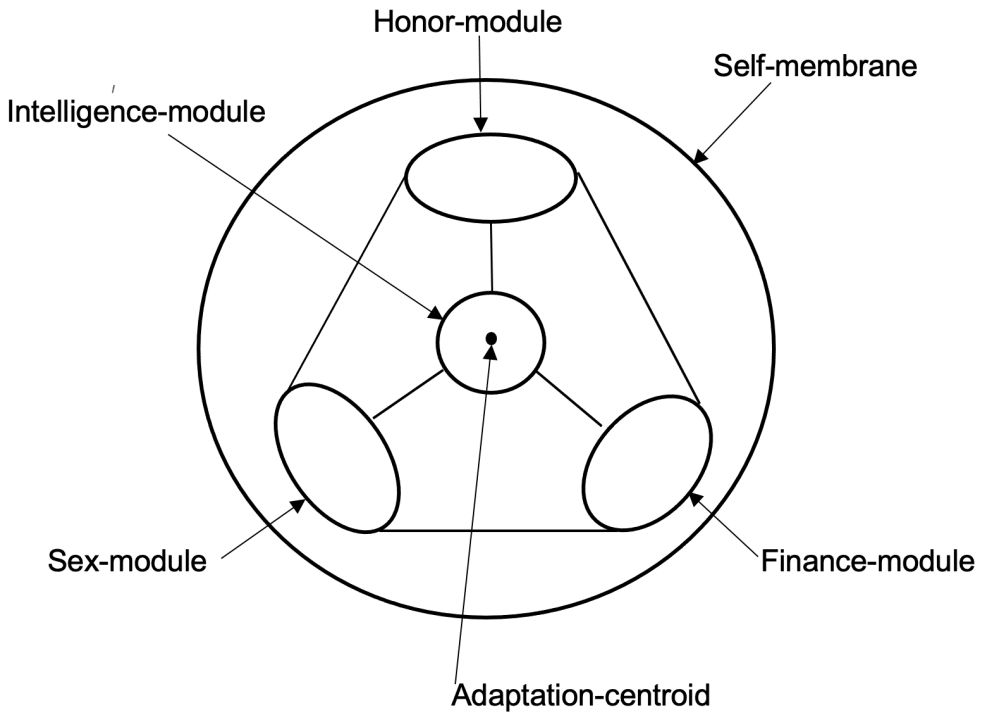

Figure 5. Society-psychological SELF. The Sensitivity-module and the Sympathy-module of the personality-psychological SELF are integrated into the Sex-module. The Sex-module is responsible for reproduction. The Sympathy-module and the Behavior-module are integrated into the Financial-module. The Financial-module is responsible for financial power. The Behavior-module and the Sensitivity-module are united into the Honor-module. The Honor-module is responsible for a high social hierarchy. The Intelligence-module that compatibly integrates the social desires is placed in the centroid of the triangle.

4. Structure of Recognition-Behavioral World

4.1. Recognition-behavioral WORLD constructed by the Intelligence-module

Intelligence-module, the core of Human intelligence, constructs the recognition-behavioral WORLD by developing the recognition-behavioral SELF. The adaptation centroid of the SELF extends to the Bird-eyes view point, and the extension-line is distinguished as the Inference-axis involving ascending Induction and descending Deduction. The Intelligence-module moves on the Inference-axis, and it organizes the WORLD along the Inference axis. The WORLD differs in the 3spaces-hierarchy of Property space, Reasoning space, and Model space. The Property space involves the

association network of words/signs, the Reasoning-space involves the association network of terms/formulas formed corresponding to the single-modeling-codes coming from Analogy and Pattern-recognition, and the Model space involves the association network of concepts integrated corresponding to the meta-modeling-codes formed in the Neuronal Network. The association hierarchy is covered by the WORLD-membrane indicating the cognition-limit. The modeling-code of the WORLD is represented like the symbolical figure of Mount Meru (Figure 6). The association network of the Reasoning space has been structured for hubs of key-terms/key-formulas like a Mind map. The Intelligence-module catches a hub on the Inference-axis, and it reductively analyzes the hub with the scientific procedure. A holistic comprehension is induced by catching the center hub of the Mind map. The recognition-behavioral WORLD of the researcher is identified with the association-network structured via the inductive learning and the reasoning ability acquired via the deductive experiences, and the learning and the experiences have developed by incorporating the works of the predecessors. The developmental task of the researcher is followed by the steps of the phenomenological verbalization in the Property space, the intuitive hypothesis-forming in the Model space, and the sound hypothesis-testing in the Reasoning-space, and their scientific argument-form syllogistically develops. The researcher's economical and stubborn thinking-manner is induced by persisting in a hub of the Mind map; nevertheless, the persistence would produce the Eureka effect. Serendipity occurs when the researcher finds another hub in the Mind map, and Synchronicity occurs when the researcher is looking down at the Mind map from the Bird-eyes view point.

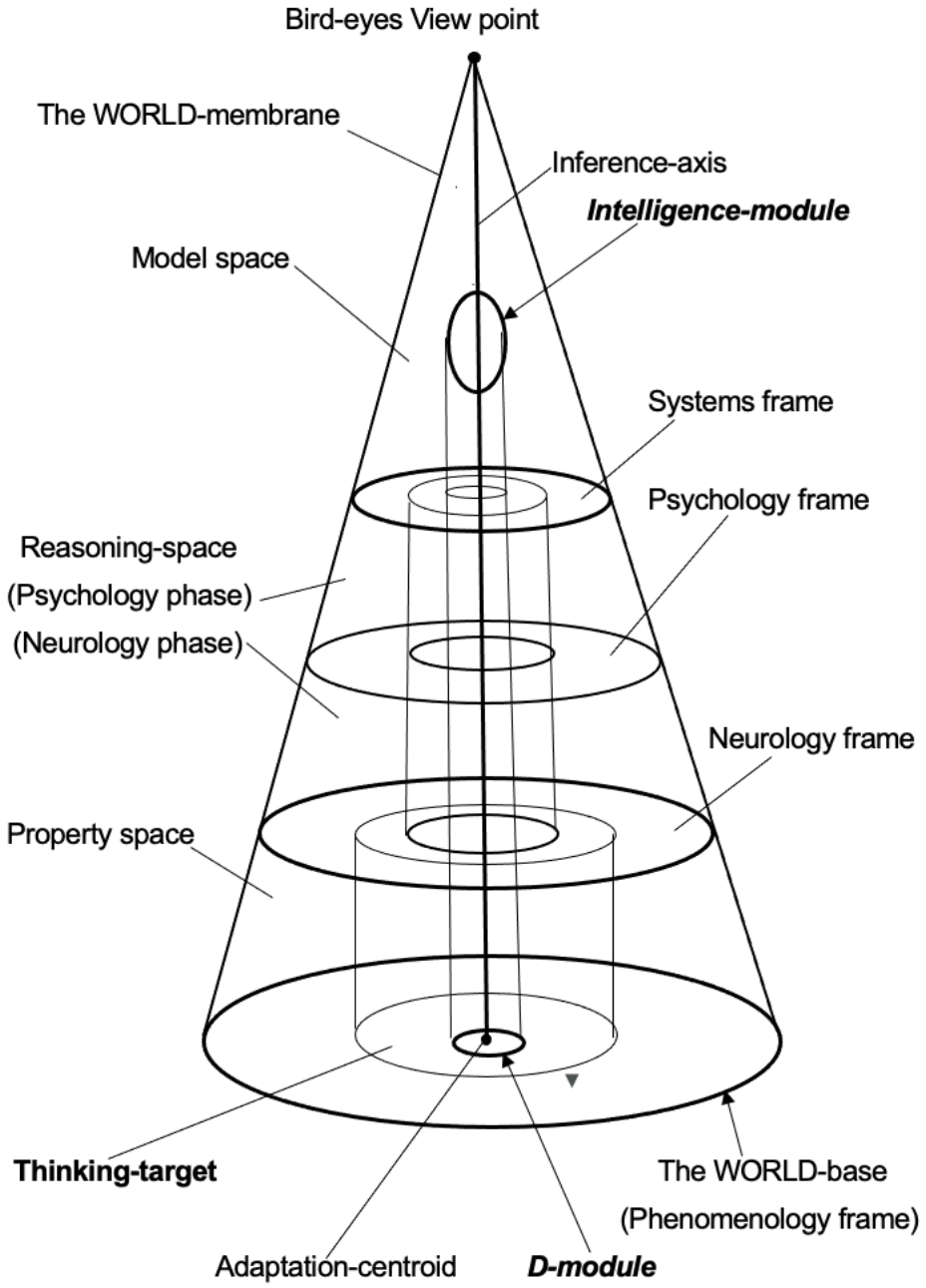

Figure 6. Recognition-behavioral WORLD. The Intelligence-module, the core of Human intelligence, constructs the recognition-behavioral WORLD by developing the recognition-behavioral SELF. The adaptation centroid of the SELF extends to the Bird-eyes view point, and the extension-line is distinguished as the Inference-axis involving ascending Induction and descending Deduction. The Intelligence-module moves on the Inference-axis, and it gives qualitative/quantitative connotation to a single-model by ascending toward the Bird-eyes view point with the learning, and assesses the validity of the single-model by rotating along the

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Inference-axis with the experiences. The recognition-behavioral WORLD developing along the Inference axis differs in the 3spaces-hierarchy of Property space, Reasoning space, and Model space. The Property space involves the association network of words/signs, the Reasoning-space involves the association network of single-modeling-codes producing the terms/formulas, and the Model space involves the association network of meta-modeling-codes producing the concepts. The hierarchy is covered by the WORLD-membrane indicating the cognition-limit. The modeling-code of the recognition-behavioral WORLD is represented like the symbolical figure of Mount Meru.

4.2. Systems maintaining homeostasis of the recognition-behavioral WORLD

Intelligence-module, the core of the SELF, is required to cope with stresses shaking the homeostasis of the SELF. Neuro-psychiatric symptoms are induced via the dysfunctional modules of the neuro-psychiatric SELF, and neuro-psychiatric medication is performed for treating the modules bio-chemically[1]. Autonomic dystonia is difficult to treat with medication; however, it is treated via the cybernetic feedback system involved in the SELF. Intelligence-module, the core of the WORLD, is also required to cope with stresses shaking the homeostasis of the WORLD. Adjustment disorder is induced via socio-psychological stresses, and it is treated via a self-reference system involved in the WORLD. Animals originally maintain the harmony of the immunological WORLD via the immune system, which distinguishes the selfness and the otherness as a self-reference system. The Intelligence-module functions as the self-reference system to maintain the harmony of the recognition-behavioral WORLD in spite of the Qualia. Information about the thinking target is abstracted at the Phenomenology frame of the WORLD-base, and the Intelligence-module changes the information to a meaningful word/sign by giving connotation in the Property space. This was analogized from the Antigen presentation of the immune system. The words/signs are abstracted at the Neurology frame or at the Psychology frame, and the Intelligence-module changes them to functional single-models of terms/formulas by giving the special connotation in the Reasoning-space. This was analogized from the Antibody production of the immune system. The terms/formulas are abstracted at the Systems frame, and the Intelligence-module further integrates them to meta-models of concepts networked in the Model space. This was analogized from the Epitope memorization of the immune system, which was suggested by immunologist Niels Kaj Jerne. Namely, Psychotherapy is considered to be the

recognition-behavioral methods to treat Autonomic dystonia and Adjustment disorder by driving the cybernetic feedback system and the self-reference system.

4.3. Psychotherapy treating Autonomic dystonia

Autonomic dystonia is induced via dysfunction of the cybernetic feedback system, and researchers know that conditioning-reflection closely relates to the cybernetic feedback system. Researchers of Behaviorism pointed out the significance of the first signal system of the conditioning-reflection by investigating animal behaviors, and they advocated Behavioral Therapy, which deals with the first signal system. Researchers of Cognitive psychology emphasized the significance of the second signal system, and they advocated Cognitive Therapy, which deals with the second signal system in the social situation. Cognitive destruction tries to delete the rigid conditioning-reflection inducing invalid social behaviors. Cognitive-Behavioral Sciences have integrated Behaviorism and Cognitive psychology. Social Skill Training is a social operant-conditioning method to treat Autonomic dystonia by enhancing self-estimation. The validity of the psychotherapies coming from the conditioning-reflection could be assessed with formal logic because the conditioning-reflection is reduced to the mathematical model of the cybernetic feedback system. Mindfulness integrated Cognitive behavioral therapy and Meditation, coming from the knowledge of classical Taoist, Buddhist, and Traditional Chinese medicine. Meditation is a physical operation technique that gives absolute self-acceptance and higher self-estimation to the Intelligence-module under the transcendent tranquility of psychological Flow. Meditation is also handled as the main psychotherapeutic method of Japanese Naikan therapy, which comes from Buddhism Zen. Psychotherapists would intuitively recognize that Meditation utilizes the mechanism of the cybernetic feedback system; however, they did not verbalize the mechanism daringly because Meditation functions not via linguistic learning but via physical experiences.

4.4. Psychotherapy treating Adjustment-disorder

Adjustment disorder is induced via socio-psychological stresses coming from social desires and/or social acceptance. The great psychologist Sigmund Freud listened to narratives of clients showing psychological symptoms of social dis-adaptation, and he hypothesized a common socio-psychological self-reference system. He and his colleagues, who were interested in human social dynamism, advocated that Psychoanalysis could analyze human socio-psychological dis-adaptation via the socio-psychological self-reference system. S. Freud, who focused on the social role of sex,

suggested Freud's model, which was represented as the floating-iceberg metaphor of Id, Ego, and Super-Ego. Freud's model might come from the spirit-evolution modeling code of Sefirot. Wilhelm Reich, who adhered to Orgone energy produced via the Flow effect of sexual intercourse, advocated Body psychotherapy. Erik H. Erikson, who investigated social Developmental tasks, hypothesized that the self-reference system comes from the evolving nest-hierarchy modeling code of Mount Meru. A psychoanalyst, Henri Ey, suggested the development of dis-adaptation symptoms in his Organodynamic psychology. He would also hypothesize that the self-reference system comes from the spirit-evolution modeling code of Sefirot. Anna Freud and Melanie Klein followed Freud's idea by increasing Psychoanalysis terminology, and Jacques Lacan, who suggested the Mirror stage of human recognition evolution, represented Schema L like his master Freud. Psychotherapists belonging to the Psychoanalysis parties recommend that clients identify their social adaptation manner. Supporting Psychotherapy recommends that clients change the stressful interpersonal relationship to the stress-less one via verbalization. Schema Therapy suggests that the social adaptation manner of the client is formed by maintaining the social roles in the belonging society. Family therapy, which points out the double-binding in the troubled family, considers the family as one of the belonging societies. Abraham Harold Maslow, who integrated Psychoanalysis and cognitive-behavioral science, represented Maslow's hierarchy of needs, coming from the evolving nest-hierarchy modeling code of Mount Meru, in his Humanistic psychology. A psychotherapist, Elisabeth Kübler-Ross, who performed near-death studies, found the five stages of grief known as the Kübler-Ross model, which is considered to come from the evolving nest-hierarchy modeling code of Mount Meru. Psychotherapists belonging to Humanistic psychology parties positively estimate the client's social adaptation manner as it is. Open dialogue tries to give social positive approval and estimation to schizophrenic patients by listening to their narratives closely. Group therapy tries to increase co-estimation among client members by utilizing arts and sports. Namely, psychotherapies treating Adjustment disorder provide systematic persuasion/role-playing for clients to recover harmony in the recognition-behavioral WORLD. Alfred Adler, who focused on the social role of the honor hierarchy, analyzed the sense of inferiority in his Individual Psychology; nevertheless, he did not establish his original psychotherapy. Carl G. Jung, who knew the spiritual centroid-hierarchy modeling code of Mandala, analyzed Archetypes in his cognitive psychology; however, he also did not establish his original psychotherapy. Eric Berne, who was inspired by Freud's idea, suggested that human social interactions are performed via the communicators in his Transactional Analysis. The idea would be induced via the triangle-networking of modules involved in the SELF.

5. Discussion and Conclusion

Structuralism is the idea that human recognition-behavioral adaptation is performed corresponding to the underlying structural patterns. Since the early 20th century, Structuralism mainly functions as the meme of the humanities. A semiologist, Ferdinand de Saussure, conceived language and society as a system of relations, and he represented the fundamental idea of Structuralism in his works. An anthropologist, Claude Lévi-Strauss, extracted a common cultural structure from different societies. A psychiatrist, Jacques Lacan, applied Structuralism to Psychoanalysis by blending Freud's idea and Saussure's idea, and a psychologist, Jean Piaget, applied Structuralism to the psychological study of social adaptation development. Structuralism researchers have tried to verify the compatibility via formal logic by reducing the structure to a single-formula/graph. At present, the trials look to be successful in semiology and anthropology but not in psychiatry and psychology. Systems theory is the transdisciplinary study of meta-systems consisting of interrelated and interdependent single-models. Since the mid-20th century, Systems theory mainly functions as the meme of the natural sciences. A biologist, Ludwig von Bertalanffy, represented his famous equation describing the growth of a biological organism consisting of cells. A mathematician, Norbert Wiener, represented a feedback system, Cybernetics, that describes a communication pattern in an organism consisting of organs and/or components, and a physician, Alexander Bogdanov, thought that a physical adaptation system is maintained via Cybernetics. An ecologist, Howard T. Odum, indicated that the ecological system is reduced to a biological meta-system complex-networking the biological single-models, and he further indicated that an emergent ecological shift could be explained by topologically figuring the biological meta-model. The human recognition-behavioral adaptation system maintains homeostasis of human intelligence, recognition-behavioral SELF, and recognition-behavioral WORLD, and the adaptation system was scientifically analyzed with the methodology of Structuralism and Systems theory. The recognition-behavioral adaptation system of Human Intelligence was analogized from the substance metabolism system, and it was considered to be the language-metabolism system utilizing the modeling-codes formed in the Neuronal Network empirically. Human thinking patterns come from the modeling-codes; in fact, the scientific procedure comes from the syllogistic modeling-code of Trimurti, and the causality-sequence comes from the diagram modeling-code of Sefirot. Nevertheless, human intelligence performs the scientific procedure in an economical and stubborn manner. Human Intelligence has inductively introduced a mathematical idea of a Turing machine; however, the deductive procedure is unlimitedly performed by AI. The recognition-behavioral

adaptation system of the SELF was considered to be the meta-model system complex-networking the functional single-model systems. The meta-model system maintains homeostasis via the cybernetic feedback system involved in the single-model circuits. The cybernetic feedback system comes from the opposite but interconnected forces modeling-code of Yin-Yang Taiji and the complex-network modeling-code of Wu Xing. Human neurological/psychological realities were holistically explained via the idea of the cybernetic feedback system. Behavioral ecology grows by considering animal society as the collective SELF. The intelligence module, the center module of recognition-behavioral SELF, constructs WORLD corresponding to the nest-hierarchy modeling-code of Mount Meru. The intelligence module copes with stresses shaking the homeostasis of the WORLD with the self-reference system, like the antibody-producing system of the immune system. The self-reference system also comes from the ascending nest-hierarchy modeling-code of Mount Meru. The reality of Psychotherapy was explained with the cybernetic feedback system and the self-reference system. The present modeling-codes have been transferred via the symbolical figures shared in the philosophies cultured in different societies. Orient societies, which are familiar with an ideograph like Chinese characters, have transferred the opposite but interconnected forces modeling-code of Yin-Yang Taiji, the complex-networking modeling-code of Wu Xing, and the centroid-hierarchy modeling-code of Mandala. The modeling-codes have induced the holistic worldview to researchers belonging to these societies. Occident societies, which are not so familiar with the ideograph, have transferred the syllogistic modeling-code of Trimurti, the causality-sequence diagram modeling-code of Sefirot, and the ascending nest-hierarchy modeling-code of Mount Meru. The modeling-codes have induced the reductive worldview to researchers belonging to these societies. Finally, it was considered that the human recognition-behavioral adaptation system is the language modeling system emergently working like the substance metabolism system and the immune system. This consideration might contribute to the further development of Evolutionary psychology.

Abbreviations

- C: Cholinergic neuronal module
- A: Adrenergic neuronal module
- S: Serotonergic neuronal module
- D: Dopaminergic neuronal module
- ASD: Autism-Spectrum Disorder

- ADHD: Attention-Deficit Hyperactivity Disorder
- TIPI: Ten-Item Personality Inventory
- AI: Artificial Intelligence
- DNN: Deep Neuronal Network
- RNNs: Recurrent Neural Networks
- MRC: Machine Reading Catalog
- GPT: Generative Pre-trained Transformer

Statements and Declarations

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