

## Psychopharmacology and psychotherapy. The nexus serpents

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*The integration of psychotherapy and psychopharmacology – one of the most important contemporary tasks is discussed here from a historical perspective and various theoretical points of view.*

*Key words:* psychotherapy, psychopharmacology

*Art begins where mathematics concludes (Pascal)*

### Preface

The attempt to link psychotherapy and psychopharmacology may seem pretentious given the enormous scope of each of these fields. Their integration is in effect a microcosm of the universal connection between the brain, the organic component of the soul, and the psyche, the psychological component. When we study whether an integral whole can be made of these two different worlds, we are really asking whether humankind can surpass the limits of linear thinking – the convenient route, but not the real one – to the much more difficult globular thinking, which synthesises many worlds into one.

The serpent has been the symbol of medicine since the age of Asclepius. The ancient Greeks believed that the serpent had two roles: a practical one, served by its venom, which was used to produce (sometimes fatal) drugs and potions, and a mystical one. The serpent was the sacred animal of Asclepius, God of Medicine, to whom temple people came to dream “healing dreams”. These dreams were related to the priests who would interpret them for purposes of curing illness and resolving problems.

The serpent thus represents the synthesis between psychotherapy and psychopharmacology. Synthesis, in this sense, is the intellectual operation whereby we collect elements of knowledge about specific areas and organise them into a coherent, structured, homogeneous system. It goes beyond the development of two parallel systems, where each maintains its independent philosophy, basic theory and techniques, or of

a comprehensive system, which incorporates complementary schools of thought. To determine when and how drugs should be added to psychotherapy, and when and how psychiatric symptoms are better treated by psychopharmacology, we seek the point at which these two disciplines merge – much like when the synthesis of electrical signs produces sound in a synthesiser. This juncture is not a linear cross-section of two cycles, but rather a mixture or coalescence of two worlds that are, so to speak, swallowed by each other like two snakes, and no one knows where one ends and the other begins. In a true synthesis, the individual parts do not simply supplement each other – they intermingle and are transformed into a new integrated whole which is greater than its parts. This is, therefore, a procreative process.

The existing concept of psychiatry is a linear one, connecting two factors in a cause-and-effect relationship. This concept is advantageous in its clarity but weak, in our view, in its distortion and “flattening” of multidimensional real life. Though the search for a linear connection between factors is basic to human thinking, it does not necessarily conform to the genuine expression of nature. And because it simplifies life, it must inevitably distort it. The transition to a globular or multidimensional world-view characterises many fields of science today, such as mathematics and physics. It has allowed for the development of the uncertainty factor, the theory of probability, and quantum theory. For example, time in modern physics no longer moves in a straight line – it wrinkles and folds onto itself, going from past to future and back again, with events from the past changing the future and events from the future impressing the past. This concept is in line with Freudian analytic theory, according to which childish traumas happen post factum [6]; that is, they are a part of the sequence of events until a future event causes regression, making a specific event within the sequence traumatic.

If modern physics can be integrated with analytic psychotherapy, why not the – albeit more ambitious – integration of “biologic-organic” psychiatry with “dynamic” psychiatry. Though these concepts seemed remote, even antithetical, from the start, in our opinion, they are, in fact, mutually dependent and indivisible. Neither can be abolished or denied, because together they form an integral and fundamental whole.

The psychological whole means, by definition, the therapeutic whole. In psychiatry, therapy constitutes the comprehension of the whole patient. Therefore, there is a logical failure in considering comprehension as “dynamic” but medical care as “organic”, or vice versa.

In this discussion, we present several theories connecting these two worlds. We suggest that the therapeutic process be grasped as a synthetic or globular one, and not a practical cause-and-effect process.

### **Classical theory**

Ostow [10,11,12] was the first to link psychopharmacological clinical data with analytic assumptions. Specifically, he studied the extrapyramidal influence of psychopharmacological drugs, motoric changes in patients with affective disorders, and neurophysiological phenomena. This work, despite its weaknesses, is important in its

effort to describe the reciprocal connections between medicine and personality. Ostrow voiced a concern that broadening the theory would eventually undermine the analytic method and hence exclude psychoanalysis from the realm of science.

According to Kandel [8], by the 21<sup>st</sup> century, the influence of psychotherapy on the mind would be significantly inspired by biological research and would become a major issue. He believed researchers would focus on eight major domains: the nature of unconscious mental processes; psychological causality; psychological causality and psychopharmacology; early experiences and mental illness; the unconscious and the para-frontal cortex; sexual orientation; psychotherapy and modification of the mental structure; psychopharmacology as a supplement to psychoanalysis. Thus, in Kandel's view, a "dialogue" between biology and analysis is important to "read" the mind's function (cognition). Some researchers are opposed to inserting biology into the world of analysis for fear it will qualitatively reduce analysis to the neurobiological level. However, Kandel claimed that this is impossible because neurobiology, analysis and cognition may overlap, but they are not alike. Biology demands preciseness and an inflexible way of thinking. Its role is to direct the researcher in specific directions and enable analytic profundity. These directions include heredity and genetics, the cell structure, the development of the body, and the mind scheme. Analysis harbors a latent intensity defined by the complexity and sonority of the issues it deals with (even Kandel could not specify which). Thus, it is important in guiding the more sophisticated comprehension of the link between the mind and the psyche.

We criticise Kandel's theory because it uses the same terms for two different matters. He links the fields linearly, without creating a multidimensionality that would allow "space" for each to stand as a unique entity with a unique value, with free motion between them. Therefore, the connecting lines he builds become instead constraints. One example of a globular approach is the theory of Globus and Arpaia [1], described later.

### **The globular concept**

Cognitive science treads the fine line between artificial intelligence and the science of the brain, cognitive psychology, languages and the philosophy of the mind. In contrast to the linear approach, which regards the brain as a computer, the globular approach sees the brain as a sophisticated system that can present chaotic behaviours. Although it appears to act at random, it is fundamentally determinate, but the intensity of its action is not related to the intensity of its effect. The non-linear model uses a visual spectrum to describe the system's behaviour. The system's evolution through time follows a topological route. This multidimensional space, or hyperspace, is a mathematical space, and each variant represents as a dimension within it. The entry of each variant in time (t) is expressed by a dot.

In neuronal systems, the activation of each neuron in the net represents a dimension, and the state of each neuron is expressed by numerous dots all over the N variants. The system's development over time follows a course in the hyperspace. The topology of the neuronal system is restricted by the system's internal and external development

and self-organisation ability. The system itself is further limited by the input-output and intersynaptic connections; it also requires restrictive modulation, or *tuning*, from time to time.

At any given point of inception, and under the given restrictions, there exists the most likely (and therefore the most stable) situations, which we call *attractants*, together with the most unlikely (and therefore the most unstable) situations, which we call *repellers*. The courses within the system move between these two states. The hyperspace topology determines the level of fulfilment and the attractants enable maximum fulfilment.

The flow of information within the nervous system depends on the number of interactions in the system. The limitations in these interactions set the distinction between apparently equal neuron masses. The limitations might be fixed, for example by genes, or they may be “tunable”, for example, by the release of a classical transmitter in a low frequency and another neuron-peptide at a high frequency. Tuning is important because it is transient and enables changes in flow, which keep the system dynamic and flexible. It is also self-regulated: the brain tunes itself, not according to rigid rules but according to the modulation of its limitations. That is, its response to input from within the system and to stimuli received from without leads to fluctuations in the hyperspace topology. Thus, the brain invigorates its own development via self-modulation.

This is the key to our understanding of the nonlinear theory of brain functioning. In contrast to the computer, which is organised externally by the programmer, the brain organises itself under the conditions imposed by its limitations. We believe the variable condition of this dynamic super-web with its dynamic components that direct the stream of information along the courses in the hyperspace is the unconscious, and its changes are reflected – and analogous to – the variations in conscious behavioural states.

The accepted biological psychiatric concept stipulates that when something is disrupted chemically, it should be treated pharmacologically. According to the nonlinear framework, psychotropic drugs improve the encephalic tuning, but they do not “cure” the brain. During illness, the limitations on the cerebral *modus operandi* are altered, leading to behaviours that reflect this alteration. Thus, mental illness, both affective and cognitive, is a primal disorder of “drive tuning”. Pharmacotherapy improves the tuning, but behavioural therapy is also needed to improve the external manifestations of the adaptation to the limitations. The interpersonal (dynamic) therapist therefore requires eclectic means to influence different adjustment mechanisms.

For example, to understand the manic-depressive state, we need to account for three factors: motor activity, affect level, and energy. The system, to fulfil its limitation states, will be fitted to all three. Thus, a person who suffers from major depression shows vegetative signs, with low motor activity and negative affect. A person who suffers from bipolar disorders shows both sides when the transfer from the state of depression to euphoria or vice versa consumes less energy.

The nonlinear concept cannot capture the whole image at one time, because once merged, the whole becomes an autonomous, indivisible, third entity.

### **The synergistic concept in the clinic**

To demonstrate the synergistic relationship of the mind and psyche as epitomised by the relationship between psychopharmacology and psychotherapy, we will describe two states in child psychology, a normative one and a pathological one. We chose the child because the synergism between the biological, psychological and social is clearer in this age group.

The creation of the individual child occurs within a physical, social and psychological network. It involves countless factors, such as fecundity, physical health, a wish for a child, peer pressure, use of aids (and its causes) and disuse of contraceptives (and its causes). The gestational period affects many areas external to the fetus, and the fetus itself is affected by them. At birth, he (or she) is born into an already loaded environment, combining the physical and emotional effect of gestation and birth with the emotional and social elements of the lives around him. Any attempt to separate them is destined to fail. Their mutual effect is so immense, we cannot determine post factum the absolute importance of any one factor. Take, for instance, the heated debate on whether intelligence is hereditary or environmental.

The normative state we will discuss herein is the temperament, an essential but elusive factor that exists already with the infant's first breath and is considered one of the most important influences over the lifetime. The pathological state we will discuss is attention deficit hyperactivity disorder and the controversy surrounding its place in the field of mental health: organic or psychological.

### **The Temperament**

The temperament is the organic core of energy the child carries with him into the world. It is also the core of his future psychological development, owing to the potential repositories and courses it offers, and owing to its effect on every interaction of the child's life from birth (or maybe even earlier).

The characteristics of the temperament play a decisive role in creating the behaviours that may come to the attention of the therapist. These behaviours range from those derived from an extreme, though normative, temperamental feature, which is perceived as abnormal by the parents and society, to specific or generalised pathological behaviours derived from a feature made pathological by a difficult interaction of the child with the environment. In the most severe cases, psychiatric disorders or physical disabilities develop, wherein the characteristics of the temperament function either as a regulator or aggravator. In all these conditions, there is cyclical communication between the physical and the mental, the organic and the psychological, and it is hard to find the line between them. This is particularly true when the illness or disability is affected by a characteristic in the intermediate zone between the physical and the mental. This characteristic induces a cascade that starts from a psychological base but eventually influences the organic state, with configurations that might be organic. The less severe form, which involves a generalised or minimised behaviour disorder, is discussed in the section on attention deficit and hyperactivity disorder.

It is now recognised that besides temperament, the interaction between mother and child, and its expression through attachment, is also important in the normal or

pathological development of the individual. This reciprocal connection takes on the momentum of a “magic circle”, in that its parts increasingly affect one another, making the circle gather strength “from cycle to cycle”. One expression of this connection is fear/anxiety behaviour. According to Kochanska [9], there are two pathways to internalisation: one based on fear of the parents, and the other based on a positive cooperative experience with the parents. These pathways develop differently in children with different temperaments, with the child’s connection with the parents (and the discipline derived thereof), defining the manner in which he will react in the future to failure or error. A reassuring relationship combined with gentle discipline, without pressure, reduces the probability of the internalisation of fear/anxiety. However, the temperament factor has an equal weight in this process, and it is the balance between the temperament and the attachment style that determines the final form of the internalisation. Thus, a temperamentally fearful child, even with a reassuring connection and gentle discipline, may not necessarily have a completely positive internalisation. This is a good example of the greater importance of the whole over its individual parts.

Other buzz words today in the study of child development are risk factors, protective factors and resilience, to name a few. These are all offshoots of temperament, and they move in the same spectrum between the organic and the psychological. For example, the qualities that determine resilience (or lack of it) are derived directly from the temperament or accompany it. They are a psychological expression of the emotional outcome of primal factors, which are mainly organic, and they serve as the compass for the map that ties the child with this world.

### **Attention deficient hyperactivity disorder**

Attention deficit hyperactivity disorder (ADHD) is an interesting example of a pathological synthesis of the organic and the psychological. Though the syndrome involves poor concentration ability, its borders are vague. In Hebrew, it is called attention and concentration disorder. What is the difference between attention and concentration? We suggest that attention is defined as the organic component of concentration, that is, the physical part of the mind that enables the development of the ability to concentrate. Concentration is defined as the sum total of all the cerebral activities, together with all the mental, emotional and environmental states that enable us to sit quietly and receive information. Hunger, weariness, languor, sorrow, motivation and interest all affect concentration. Attention, as well as distraction, appears as a characteristic within the temperament, while the attendant factors that characterise ADHD, such as bad mood, low reaction threshold and high activity level – are all behavioural manifestations.

Regarding the organic component of ADHD, neuroanatomical studies have shown that affected patients have a decreased volume of the right frontal lobe as a whole and in specific nuclei; neurophysiological studies report a relative decrease in oxygen and glucose consumption; and neurochemical studies report a decrease in dopamine secretion by the presynaptic cells and a decrease in dopamine consumption by the postsynaptic cells [2]. Globus and Arpaia (1994) placed these findings within a three-dimensional picture. They claimed that several subsystems within the hyperspace network, which

together form the consciousness supernet, participate in the learning experience. The participation of a specific subsystem in the hyperspace depends on two components: input and attention. If the stimulus is located inside the system range, and if attention is directed to that system, a response will be initiated. If attention towards a specific subsystem is interrupted, the visual memory fails to function. Therefore, attention mobilizes the subsystems to take part in the supernet. The brain itself adjusts its nets through chemical neurotransmitters [7]. Taken together with findings of a connection between ADHD and dopamine [2] leads to the hypothesis that the disturbance in internal tuning is caused by an organic defect in the supernet.

Alongside this biological concept is the analytic-psychological concept tying attention disorder to lack of emotional continuity in the mother-child connection and a disturbance in object relationships, which decreases the child's ability to achieve object constancy [5].

Neither of these concepts – the biological (dopamine state) or the psychological (lack of emotional continuity) – fully explains ADHD. This is highlighted by the only partial efficacy of sporadic treatment (e.g., Ritalin) as the sole management approach. Rather, we need to consider ADHD from the globular view of mind-psyche synergism. The emotional and social development of the child is not less contributory to the development of the disorder than possible presence of a minor neurological (organic) disorder. The child's contact with the environment, his developing self-image, and his parents' acceptance (or unacceptance) of him, could all exacerbate or lessen the effect of the primal organic damage. This can be compared with the formation of a pearl, wherein penetration of stimuli into the oyster shell causes petrification around the primal defect. In the child, too, growing circles of damage (petrification) around his self-image and scholastic and social functioning are reflected in the future in broader areas, such as motivation, self-control, and empathic ability. The importance of the aspect of psychological development in ADHD is demonstrated in the one-third of affected children who ostensibly "recover" from it in adolescence; that is, who achieve normal attentive ability as measured by continuous performance tests and other means. Some of these children nevertheless continue to show all the other signs and symptoms of ADHD, even without a disturbance in the attention itself. They continue to be poor students, have difficulties concentrating in the classroom, are unmotivated, have low self-image, and have social interaction difficulties. Eventually, they are taken out of the school setting. Apparently, the attention improved, but the concentration, as an expression of the totality of the problem, remained damaged.

This view of ADHD has led to a change in its therapeutic management to a multi-dimensional mode. Treatment today consists of psychotropic drugs, to treat the basic organic component, combined with psychotherapy, which includes also working with the parents (providing guidance and know-how to change their attitude and approach to the child) and behavioural therapy. In many cases, especially in adolescents, the addition of dynamic individual therapy is needed to work on the self-image and the damaged emotional segments. Today, the keyword in ADHD therapy is individuality: tailoring the therapy and its components to the exclusive needs of the individual child. The individuality of the disorder is determined more by the child's particular emotions

and needs than by the minor organic damage, which is apparently homogeneous. Each child is a unique entity and has a unique supernet.

### Discussion

The sperm and the ovule have endless potential which is shaped and formed by the changeable surroundings. Humans are not a product solely of genetics or solely of environment, but a subtle welding of countless complicated elements of both, placing them ultimately “in fate’s hands”. The philosophy of this point is beyond the scope of this paper. The practical implication for therapists is that we need to understand the profound complexity of the mind-body and the environment-heredity connection and to approach each patient as a unique personality harboring all these factors. There are no “magic words” and there is equivocal solution.

The development of mankind can be compared to a spiral, where each personal course of life is small additional ring. The multidimensional movement starts in the womb, coursing between objects and through junctions (interpersonal) and within objects (intrapsychic). This is true for both the mother and the embryo/child. The mother-embryo dyad is dynamic and globular. Chemicals are secreted from mother to embryo through the placenta, making the placenta an “interpreter” of messages sent from the mother to the child. The material received by the embryo invokes different reactions that together fall under the term “experience”. Though, the embryo seems isolated and remote from the outer world, its emotional base is already being formed. The embryo then transfers these experiences back to the mother through the placenta and by motion. These fetal behaviours in turn evoke new experiences and emotions in the mother, and the mother responds. (Example: embryo stops moving – the mother eats sweet food; embryo moves too much – the mother soothes). The dyad becomes a closed circle, absorbing from the outside and yet intact within itself.

Thus, already from the start, human nature is a sophisticated, multidimensional system which can be understood only according to the rules of probability. This system grows and develops in an exponential manner throughout the course of life. If, as Kandel claims, psychotherapy affects the brain structure, then every strong experience, profound thought, or mental act may affect brain structure as well. The brain is a dynamic organ and has unlimited development ability. Included in the sophisticated human system, it makes the individual a complex and unique entity. Therefore, we cannot hope to comprehend him using only a single tool.

Scientific analysis is not new to mankind, nor is the use of one tool at a time. It is analogous to “monotheism” wherein faith is defined by a single basic tenet. Yet when it comes to analysis of the human mind, this approach is very dangerous. The twentieth century was characterised by two major revolutions in medicine, without which this discussion could not even take place. The first was the psychological revolution, i.e., the discovery of the unconscious and the proposition of basic laws of mental development. The second was the biologic revolution that came in the wake of the discovery of drugs that affect mental faculties, and the determination of genetics as the basis of the personality. Both revolutions promised to “bring the Messiah”, to cure the human race

of mental disease. Both failed. However, the disenchantment following each revolution did not generate a change in the concept; it simply induced researchers to seek a new Messiah. Today, we face a burgeoning third revolution – the social revolution – which emphasises the importance of the home, spouse, and family in normal development. One example so far is the combat reaction which seems to be caused mainly by social elements; no underlying biologic or psychological elements have yet been isolated. It is precisely now, when the revolution is only starting, that we need to be on the alert. Should we try again to find all the answers through a single, narrow linear pathway? Will we wake up in 50 years only to find that we have simply marked time?

In his essay, “Pinocchian, alienated and newly committed youth”, Arieti [1] discusses the danger of splitting science from humanism. He warns against using only scientific methods in all life spheres because this could destroy individualism and lead to depersonalization. Science without humanism as a nourishing and fertilizing factor becomes, in Arieti’s words, a statistical science, oppressing the uniqueness of the individual. At the same time, humanism without science, aroused primitive passions and motives and leads to violence and cruelty and ultimately, to chaos. We suggest that even more dangerous is the co-existence of science and non-science, where the rift between them is in human space. Only their mutual existence can lead to the proper development of mankind. Without science we are lost, but without humanism we are doomed.

According to the multidimensional concept, the split between the biologic and the psychological is artificial because these spheres require reciprocity to exist. Today’s social revolution is of tremendous significance, but only if it is incorporated within the multidimensional world view. Like in the inner developmental world of the child, these three areas – the biological, psychological and social – form three vertices, each representing at one and the same time a world in itself and together, in synthesis, a greater “over-world”, at the center of which is the human being.

It is important to emphasise that the combination among the different elements that form the synthesis is not necessarily always positive. One element plus another may equal “one plus one” or “one minus one”. It is their complete merger that creates the mental map, with synergisms and antagonisms. To continue to analogy the modern physics, the inner space (hyperspace) contains not only planets but also black holes; some factors attract, others repel.

All therapy, therefore, to be effective, must address the whole human creature, and not any particular part or parts. Implementation of the globular concept closes the succession from the normative developmental concept to the pathological development concept to therapy. Accordingly, therapy should aspire to be “globular”. As defined by the theory of probability, pharmacology and behavioural therapy – “one plus one” – may lead to two or to more than two or to less than two and, in certain situations, even back to one. None of these solutions can be extrapolated from one person to another or even from one point to another. In therapy, the synthesis of the biological, psychological and social takes on a substantial and practical expression. Therapy based on the combined concept is, therefore, not a preplanned prescription with rigid rules, but a flexible system that should be modified for each individual,

carefully and uniquely.

Language is made up of verbal and syntactical components which form endless meanings and connotations. It is the transcendent expression of the completeness of human globality. Therapy may be likened to the code of language that describes what we see. Mental apperception disorder is a code that we try to decipher in analysis using verbal language. The organic disorder is also a code, no less complicated, which is deciphered in another language. In mental illness, the organic code and the mental code move in a complicated pattern of emergence and disconnection, and the connecting and disconnecting points remain unknown.

For example, take anxiety disorder. The biologist sees it as a complicated organic mechanism that acts through sophisticated biochemical and physiological codes. He is right. The analyst sees it as a sophisticated mental mechanism that acts through defence mechanisms and concealed memories from the past. He is right. The social psychologist sees it as a reflection of dysfunctional external social mechanism. He, too, is right. Each of these experts tends to the patient according to his or her method. However, with regard to the comprehension of the whole disorder, they are all wrong. Anxiety is a "circle" created by biological, mental and social mechanisms with all their reciprocal influences, such that each separate component is a fragment, not an integer. For therapy to be meaningful, it should contain the ingredients to address the synthesis of all these segments into one syndrome of anxiety.

How do we perform this integration? Are we not like the man who tries to tell time by studying the parts of dismantled clocks. Is it the split between the patient's body and mind, or is it the split between the therapists' concept A and concept B? The moment we start to deal with borders, to draw lines between one entity and another, the circle is broken, and the mutual influences of the different mechanisms is lost.

Why does the split occur between the different world views? It leads to different therapies by different therapists, but whom does it serve? It puts matters in terms of black and white, thereby encouraging wars. Do we really need these wars, when the truth is right there before us? Does human aspiration for knowledge mean willingness to fight for a cause?

The symbol of our topic is the nexus serpents. These two snakes exist in many rituals and symbolise endless experience as the absence of the primal source. According to our concept, the body and mind are intermingled exactly this way, without a starting point or finish line, without a winner and loser.

In the movie *Wild Strawberries*, a doctor was blamed for acting like God and ordered to plead forgiveness. The sin of the modern psychiatrist is imagining that he supersedes God by his attempt to break connections made by God. This leads us to turn chaos (which exists by the theory of relativity), to something clear and logical, so that the individual is not intimidated. It is simultaneously an attempt to understand Creation and to rebuild it. This issue also comes up in modern physics under the theory of absence of objectivity which contends that it is impossible to experiment without changing the world in which the experiment is done. The attempt to understand nature leads the human being to what is beyond his nature, or what the Greeks called *hubris*. Hubris is the basis of human thinking and achievement, and also the basis of human

torment. Thus, by rejecting the multidimensional approach, the therapist condemns not only himself, but also his patients.

We suggest that the milieu approach replace the individual-therapist approach to therapy. If splitting is corrected by integration, the therapists' splitting might be corrected by the integration of the therapeutic team. A single therapist cannot know everything, but a team might find different answers to different needs. It should be remembered, though, that for the milieu approach to be successful, for it to be globular and not linear, the different meanings of the symptoms as well as the various and separated values of different therapeutic schools need to be internalised by each therapist. Otherwise therapy becomes a battlefield between "Crusaders" holding forth alienated "monotheistic" concepts. Each therapist has to adopt a set of values and concepts which, being nonlinear, may feel "uncomfortable" to our logically-trained minds. However, it will force us to confront the chaos without the aid of imaginary guideposts and imaginary lines. Mankind must have gone through a similar experience when they learned that the earth was round and when they learned that the universe was composed of four dimensions, not three. But knowledge is a means to achieving liberty. So despite the initial confusion it causes, it ultimately allows for deeper understanding, which means a little more freedom to move about in the labyrinth of the mortal mind.

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