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Sanogenic Thinking of Ukrainian Youth: Challenges and Mental Health Strategies in the Context of Military-Political Stressors

Khrystyna Tsomyk
Doctor of Philosophy (PhD in Psychology), Lecturer of the Department of Theoretical and Counselling Psychology, Mykhailo Drahomanov Ukrainian State University, Kyiv, Ukraine. k.b.tsomyk@udu.edu.ua, https://orcid.org/0000-0001-6080-3786

Myroslava Kulesha-Liubinets
PhD (Psychology), Associate Professor of the Department of Clinical and Rehabilitation Psychology, Vasyl Stefanyk Carpathian National University, Ivano-Frankivsk, Ukraine. myroslava.kulesha-liubinets@cnu.edu.ua, https://orcid.org/0000-0002-9130-1719

Tetyana Ivanova
Docent, Candidate of Psychological Sciences, Associate Professor at the Department of the Psychology, Political Science and Sociocultural Technologies, Sumy State University, Sumy, Ukraine. sociol8tanya@gmail.com, https://orcid.org/0000-0002-9394-8858

Svitlana Pukhno
Candidate of Psychological Sciences, Associate Professor of Psychology Chair, Educational and Scientific Institute of Pedagogy and Psychology, Sumy State Pedagogical University named after A.S. Makarenko, Sumy, Ukraine. svetlanapuhno@gmail.com, https://orcid.org/0000-0001-9862-5145

Iryna Opanasiuk
PhD (Psychology), Professor (Senior Lecturer) of the Department of Developmental Psychology, Vasyl Stefanyk Carpathian National University, Ivano-Frankivsk, Ukraine. iryna.opanasiuk@cnu.edu.ua, https://orcid.org/0000-0003-3626-0691

Olga Sklianska
Candidate of Psychological Sciences, Associate Professor, Associate Professor of the Department of Psychology, University of Customs and Finance, Dnipro, Ukraine. olga.sklianska@gmail.com, https://orcid.org/0000-0003-3159-8765

Abstract: *The article is devoted to the conceptualisation and neuropedagogical modelling of sanogenic thinking as a cognitive-affective resource of youth psychological resilience under conditions of war and chronic stress. The authors analyse sanogenic thinking within the framework of the modern neurocentric paradigm as a dynamic system that integrates metacognitive awareness, emotional regulation, and the reconceptualisation of experience. The aim of the study is to theoretically substantiate the category, select relevant techniques for its stimulation, and develop strategies for psychohygienic support. The methodological basis includes the analysis of interdisciplinary neuropsychological literature, projective-modelling, and systemic-organisational approaches. The authors propose an somatosensory-cognitive model for influencing sanogenic thinking, involving body- and cognitively-oriented practices (conscious and voluntary rhythmic movements, coworking and collaboration, perception of musical works, etc.). These and other neuropedagogical mechanisms, predominantly applied in group activities, rely on sensory and motor techniques within the context of neuro-social mechanisms of mutual trust, support, participation, and shared experience. The proposed model offers promising prospects for practical implementation in the system of youth psychorehabilitation during wartime and holds potential for international scalability.*

Keywords: *neurosocium; psychoeducation; collective and personal determinants; mental hygiene; cognitive hypercontrol; patterns; neurophysiological mechanisms.*

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1. Introduction

Despite extensive research on post-traumatic stress, a significant scientific gap still exists. It concerns the lack of empirically grounded data on how group-based sensorimotor activities (as opposed to individual cognitive techniques) affect neurodynamic balance in youth. This article aims to address this gap by formulating falsifiable hypotheses based on a systematic analysis of neurophysiological mechanisms.

Hypotheses for future empirical investigation.

- *Hypothesis 1* (Sensorimotor dominance). It is hypothesised that regular participation in structured sensorimotor activities performed within volunteer hubs will improve emotional regulation and reduce perceived stress through enhanced prefrontal cognitive control compared with participation in psychoeducational activities alone.
- *Hypothesis 2* (Social affiliation). It is hypothesised that participation in socially meaningful group-based activities will strengthen perceived social connectedness and psychological resilience, resulting in lower anxiety levels and greater adaptive coping than participation in individual interventions.
- *Hypothesis 3.* It is hypothesised, according to Ukhtomsky's theory of dominance, first formulated in 1923,that a stable sensorimotor dominant focus may counteract excessive limbic activation, thereby contributing to emotional regulation. This assumption requires further empirical verification using neuroimaging methods.

Hypothesis 4. (Cognitive flexibility): Regular participation (at least three times per week) in a “healing neurosociety” over one month will lead to increased cognitive flexibility (as measured by the Stroop test and Raven’s Progressive Matrices). These outcomes are expected to exceed those of groups receiving only standard psychoeducational support.

The conceptual root of the term “sanogenic thinking” (from Latin *sanare* – “to heal”) traces back to the theory of salutogenesis by Aaron Antonovsky (1987). The researcher identified the “sense of coherence” as a key factor in maintaining health under conditions of stress.

Within the Western psychological paradigm, the concept of “sanogenic thinking” is often discussed in cognitive-behavioural therapy (CBT) and resilience studies. It is most closely aligned with the concepts of “adaptive cognitive reappraisal” and “constructive metacognitive coping”. Sanogenic thinking refers to a conscious and volitional system of cognitive operations. In contrast, “pathogenic thinking” is characterised by rumination, maladaptive self-focus, and catastrophising. Sanogenic thinking is also affect-regulated and aimed at identifying, isolating, and attenuating the impact of psychotraumatic stimuli. It can be understood as a form of internal mental hygiene. This process facilitates the transformation of perceived threat from a source of chronic distress into a manageable challenge. As a result, it reduces emotional reactivity by activating higher-order cognitive control.

The authors’ motivation to write this article and to propose neuromotor and neurosensory tools for the development, restoration (rehabilitation), and correction of sanogenic thinking in Ukrainian youth stemmed from intriguing observations. Specifically, many Ukrainian citizens, primarily women, self-organised numerous hubs, clubs, and coworking spaces, forming a kind of networked “healing neurosociety”. Within these settings, individuals engaged in manual production of essential goods for soldiers, held conversations, and listened to music – experiences through which they also found peace, a sense of contribution to future victory, and an increased resilience in enduring the burdens of war and the anticipation of their loved ones’ return.

2. Methodology

This article is based on projective modelling, defined as the intellectual construction of new pedagogical systems through the transfer of established biological patterns to social interaction. This approach relies on deductive logic rather than speculation. If motor activity activates prefrontal control (as shown in neuroscience research), then a specially organised volunteer hub may be

considered a potential tool for neurocorrection. The study also applies systematic theoretical synthesis for source selection.

This study is a conceptual modelling study aimed at formulating a predictive neuropedagogical framework for subsequent empirical validation. The modelling algorithm consists of three stages: 1) identification of the neurobiological mechanism, such as prefrontal cortex activation through motor skill engagement; 2) projection onto social action, such as the formation of collaborative networks within learning hubs; and 3) specification of the expected cognitive outcome, namely the development of sanogenic thinking.

Within the framework of the proposed methodology, "conscious and voluntary rhythmic movements" are viewed as a complex of neuromotor interventions. These interventions follow the principles of kinesthetic grounding and isochronous motor driving. The procedure consists of three sequential types of motor activity, integrated into volunteer hub practices:

- *Kinesthetic micro-isolation (fine motor skills)*: cyclic, two-handed coordinated movements involving high tactile resistance of materials (e.g., weaving camouflage nets according to predefined patterns or cutting fabric strips of fixed dimensions). The movement rhythm is set at 1–1.5 Hz.
- *Vestibular–motor synchronisation*: rhythmic body swaying at a controlled pace during group interaction. This activity is assumed to engage cerebellar pathways and to support synchronisation of respiration and heart rate (respiratory sinus arrhythmia, RSA).
- *Bilateral cross-lateral stimulation*: alternating left–right hand movements that cross the body midline (e.g., sorting and transferring humanitarian cargo along a semicircular chain).

These activities are performed continuously in 45–60-minute sessions and are combined with background auditory stimulation. The audio consists of rhythmically structured music at 60–80 beats per minute, corresponding to a resting heart-rate range.

3. Hypothesis

It is proposed that, under conditions of chronic distress, the effectiveness of cognitive reappraisal is positively associated with the presence of a sensorimotor "rest dominant". This hypothesis will be considered refuted if empirical testing (e.g., heart rate variability assessment or fMRI) demonstrates that youth engaged in neuromotor practices within hubs demonstrate amygdala activity levels comparable to those of a control group. This control group receives only passive psychoeducational support.

4. Research Relevance

Ukrainian scholars have already studied practical aspects of this issue. In their view, sanogenic thinking is defined by the capacity for resilience (an objective parameter) and personal psychological well-being (a subjective parameter). Reflection, retraumatisation, and emotional self-regulation serve as the psychological mechanisms of these two components of sanogenic thinking (Yarosh et al., 2021).

It is necessary to investigate the gap between objective geopolitical stressors and individuals' anticipatory strategies regarding victory. This discrepancy may influence the resilience of young people.

This article pursues the following objectives: a) to examine the category of "sanogenic thinking" within the framework of a neurocentric paradigm; b) to select and justify effective technologies for its stimulation; and c) to outline strategic aspects of improving youth mental health against the backdrop of war-related stressors.

To achieve these aims, we applied methods of selection and analytical review of neurorelevant literature, projecting the problems of sanogenic thinking onto neuropsychological and neurophysiological determinants; projective-modelling neuropedagogical methods for selecting appropriate techniques and technologies; and systemic-modelling methods for identifying

organisational-strategic directions for improving youth mental health in the context of military-political stressors.

Given the plasticity of neural networks and the human capacity for cognitive transformation, training methods for sanogenic thinking can reduce stress sensitisation and enhance personal self-regulation. This aligns with current research in cognitive-behavioural therapy and neuropsychological rehabilitation, which shows the potential for forming adaptive cognitive schemas even under chronic stress. Thus, sanogenic thinking holds significant promise as a preventive mechanism against the destructive impact of military-political stressors, though further empirical research is needed to integrate it effectively into psychoeducational and rehabilitation programs for youth during times of instability and crisis turbulence.

As a methodological presumption, we relied on the concept of alternativity, according to which sanogenic thinking, as a novel neuroeducational reference point, offers an alternative to traditional cognitive therapy approaches, focusing not on the suppression of emotions but on their constructive reinterpretation. Additionally, it may serve as a tool for fostering psychological resilience which is crucial under wartime stress. However, the challenge lies in fostering reflexive skills and critical thinking in young people, without which, sanogenic thinking risks remaining a theoretical concept with no practical implementation.

A second presumption was the integrative-organisational approach, already being developed in Ukrainian psychohygiene. The development of sanogenic thinking through the educational process requires the integration of methods for critical thinking, reflection, and emotional literacy (Hanaba, 2024). Educational institutions have begun implementing psychohygiene courses to help young people understand mechanisms of psychological self-protection. At the same time, a key challenge is the need to adapt educational environments to military-political turbulence, which complicates consistent work on students' psycho-emotional well-being.

Finally, a third presumption was the urgent and systemic implementation we expect in the near future. Ukrainian youth, affected by war-related psychological trauma, demonstrate elevated levels of emotional exhaustion, anxiety, and cognitive rigidity. Nevertheless, systematic engagement in socially meaningful activities may serve as an effective strategy for reformatting their psycho-emotional state and redirecting destructive dominants toward sanogenic ones.

Chronic war-related stress in Ukraine may contribute to a persistent maladaptive dominant in the neurodynamics of young people. This condition calls for a shift from passive psychoeducational approaches to active neuromotor strategies aimed at fostering sanogenic thinking.

5. International Relevance

This article holds important international relevance, as it offers, for the first time, a comprehensive neuropedagogical model for stimulating sanogenic thinking as an integrative mechanism for youth psychological recovery under chronic catastrophe, especially war. The discourse combines neuropsychological, social, and educational practices that could potentially be adapted to other crisis contexts on a global scale.

6. Sanogenic Thinking and the Modern Neurocentric Paradigm

Sanogenic thinking can be viewed not only as an individual psychological resource but also as a dynamic system of cognitive and emotional processes that shape adaptive strategies for responding to destabilising factors. This resource and capacity are referred to by scholars as "cognitive immunity", which is developed through the avoidance of excessive rationalisation (instead – reconceptualisation and attitude change) and of excessive emotional experiences (instead – affective self-regulation) (Metcalfe & Finn, 2013). Increasing research demonstrates that the potential of sanogenic thinking is determined not only by the subject's ability to engage in cognitive re-evaluation but also by their capacity to incorporate new meaningful structures into their narrative

identity (Neimeyer, 2016). This position will serve as one of the conceptual foundations for the technologies and strategies to be modelled below.

In particular, modern neuroscientific data indicate a connection between sanogenic thinking and the flexibility of neural networks in the prefrontal cortex and limbic system, which ensures effective balancing between automatic stress responses and rational interpretation of life events (Davidson & McEwen, 2012). This knowledge can serve as the foundation for neuropsychotherapeutic sanogenic practices. They are based on integrative cognitive-emotional transformation, personal rebirth, and a shift of locus of control toward the true "self", which primarily exists in safety in the here and now.

The neuropsychological model of sanogenic thinking within this concept assumes a functional shift of activity from the salience network, centred on the amygdala, to the central executive network. Projective modelling suggests that the activation of fine motor skills (e.g., weaving nets, needlework) may initiate thalamo-cortical circuits that modulate excitation within the limbic system. This process may thereby reduce the neurodynamic dominance of anxiety (Mottershead et al., 2024).

Neurophysiological mechanisms become useful for further pedagogical and psychological applications of neuroplasticity and stress adaptation techniques. For example, excessive activity of the prefrontal cortex leads to the hyperbolisation of stressors and, consequently, to "stress from stress" (Davidson & McEwen, 2012). However, there is debate and uncertainty here, as some researchers consider cognitive hypercontrol a constructive response (Ochsner & Gross, 2005), while others view it as destructive (Pessoa, 2017).

A kind of compromise in the application of cognitive control can be considered the stimulation and development of so-called "positive thinking". While several earlier works (Fredrickson, 2001) confirm that positive emotions correlate with a broader cognitive repertoire and more effective adaptation, there is also evidence (Hanley et al., 2015) that in certain situations, "stimulated" positive thinking can lead to a disregard for realistic threat assessments. This diminishes resilience in the long term, challenges reductionist models of sanogenic thinking based solely on positive re-evaluation, and requires a more complex, context-dependent conceptualisation.

Thus, if sanogenic thinking is a key mechanism of adaptation, its formation must inevitably be a component of education as an important socio-creative resource in wartime conditions. In this regard, neuro-pedagogical research (Immordino-Yang & Damasio, 2007) points to the critical role of emotional learning in the development of stress resilience, supported by cognitive reflection. In this context, the traditional educational paradigm, which emphasises information overload, contradicts the natural neurobiological mechanisms of learning: rigid disciplinary frameworks and a focus on control-based (examination) stress can produce distress-dependent thinking patterns that reduce cognitive flexibility. Alternative approaches, such as emotion-oriented learning (Hinton et al., 2008), stimulate the development of adaptive cognitive strategies that align with the principles of sanogenic thinking.

At the same time, the social and cultural determinants of this phenomenon remain important. Social neuroscience (Cacioppo et al., 2006) provides evidence that prolonged social stress (e.g., the consequences of social isolation or social injustice) impacts the neurophysiological regulation of stress, increasing cortisol levels and impairing the functional interaction between the prefrontal cortex (PFC) and the amygdala. These mechanisms give rise to a discussion about the individual (neurophysiological) determinants of sanogenic thinking and its collective neurosocial determinants in the context of the biology of group behaviour.

Thus, sanogenic thinking can no longer be regarded solely as a personal psychological resource. Therefore, comprehensive neuro-pedagogical models of stress coping, which act on neuropsychological and neurosocial mechanisms, are considered promising. Still, the following questions remain open: *Is it possible to modulate such thinking through social interventions?* and *Are there limits to the adaptability of this phenomenon, beyond which attempts at cognitive reappraisal may turn into strategic avoidance of reality?*

Answers to these questions require not only empirical research but also deeper epistemological reflection on the nature of adaptive thinking as a multifactorial phenomenon.

At the synaptic level, the concept of a "dominant shift" from pathogenic war-related stress responses to sanogenic coping is often discussed in relation to Hebbian neuroplasticity mechanisms. They include long-term potentiation (LTP) and long-term depression (LTD) of synapses (Hebb, 1949).

Chronic distress is associated with persistent hyperactivation of neuronal circuits in the amygdala complex. This state is linked to excessive glutamatergic transmission and NMDA receptor activity and contributes to a sustained "pathological dominant" of anxiety.

The hypothesised shift occurs through competitive synaptic plasticity processes. During intense rhythmic sensorimotor activity in volunteer hub settings, afferent input from somatosensory and basal ganglia circuits is activated. Such inputs engage alternative thalamo-cortical and fronto-striatal networks, including prefrontal cortex (PFC) systems.

This activity is accompanied by neuromodulatory changes, including dopamine and oxytocin release. These neuromodulators are associated with reward processing and social bonding mechanisms. Their effects may contribute to the downregulation of salience-network reactivity and may also facilitate LTD-like processes within amygdala-related circuits.

Over time, competitive allocation of neural resources may weaken previously dominant maladaptive pathways. In parallel, alternative adaptive (sanogenic) networks may become more stable through repeated activation and consolidation. This supports a functional shift in the dominant neurocognitive pattern.

7. Neuro-Motorics, Neuro-Sensory Stimulation, and the "Dominance Shift" Strategy from Destructive Thoughts to a "Healing Neuro-Society"

This framework proposes that modern neuropedagogy, based on the integration of cognitive sciences, neuropsychology, and sensory stimulation technologies, opens up prospects for psychocorrection of sanogenic thinking in youth who have experienced the psychological consequences of war. It is known that traumatic experiences disrupt the cognitive-emotional balance, causing hyperactivation of amygdaloid structures and reducing the regulatory role of the prefrontal cortex (PFC), which complicates rational reappraisal of negative experiences and the formation of stress resilience (Davidson & McEwen, 2012).

In this context, combining neuro-motor and neuro-sensory technologies with cooperative activities in a safe social environment can facilitate the gradual reconsolidation of traumatic memories, reduce anxiety levels, and restore adaptive thinking patterns. It is important to note that such psychocorrection is not purely therapeutic but integrates meaning-making activities, contributing to the restoration of personal subjectivity in youth through participation in aiding the front.

During the selection of techniques to support sanogenic thinking of personal and collective patterns, we rely on neuropsychological studies (Porges, 2011) that show that sensory stimulation in a safe environment modulates parasympathetic control of the nervous system by activating the ventral vagus, which is responsible for social interaction and emotional self-regulation. This means that background sensory stimuli (music, tactile sensations, rhythmic movements) can help reduce the activity of the hyperactivated amygdala and facilitate access to cognitive reappraisal strategies.

On the other hand, research presented in the book "Embodied Cognition" (Shapiro, 2019) shows that motor activity is crucial for the reconstruction of cognitive schemas, as it forms the sensorimotor interaction of brain systems responsible for self-regulation. The theory of embodied cognition substantiates the inextricable link between motor activity and mental representations (Shapiro, 2019). Within the framework of the present model, these principles are extended to the process of trauma recovery. Complex coordinated manual activity is proposed as a potential stimulus for prefrontal cortex activation and cognitive control, serving as a hypothetical mechanism for neuropedagogical intervention.

When applying these neuro-relevant patterns to socially patriotic forms of engagement, work, and involvement of Ukrainians during the war, we can identify specific relaxation techniques, psychological switching (in the short term), and stimulation of sanogenic thinking - such as listening to calming music or having a conversation accompanied by rhythmic movements, tactile stimulation, and sensorimotor integration – that will ensure synchronisation of neural activity in the limbic system and PFC, promoting the reduction of anxiety.

At the same time, we must also consider that social isolation is one of the major problems faced by youth traumatised by the war, as the disruption of trust in the world complicates social reintegration. Social affiliation and cooperative activity are identified in social neuroscience as factors that modulate neuroendocrine responses to stress (Cacioppo et al., 2006). In the context of volunteer hubs, this mechanism may operate through oxytocinergic modulation, which potentially attenuates the effects of glucocorticoids. However, this causal relationship requires further empirical verification, particularly within the context of military-related stress exposure. Therefore, we also introduce the neuro-social aspect mentioned earlier: it is precisely cooperative, socially significant communication and collaboration that should stimulate personal-group recovery mechanisms.

Theoretical constructs must be reformulated as target pedagogical determinants. This ensures a methodologically coherent translational shift from abstract neurocentric concepts (such as synaptic LTP/LTD mechanisms or ventral vagus activation) to applied didactic practice. Each neurobiological mechanism should be translated into a corresponding structure of socio-pedagogical action. This integrative approach creates a convergent framework that enables the transformation of biological hypotheses into applied psychohygiene technologies.

Table 1 presents a conceptual model. In this model, neuropsychological parameters are systematically mapped onto applied methods of sanogenic stimulation within youth volunteer ecosystems.

Table 1. Conceptual Diagram of the Interaction between Neuropedagogical Components

Method	Neuropsychological Effect	Pedagogical Function
Group work on crafting useful items for the military	Activates the oxytocinergic system, enhances the sense of safety and trust, reduces stress reactivity	Develops social engagement, stimulates meaning-making through action, promotes resource mobilisation
Gentle, unobtrusive communication during work	Regulates the ventral vagus, reduces amygdala hyperreactivity, improves emotional self-regulation	Creates conditions for safe interpersonal contact, restores communicative plasticity
Collective work on a “shared meaning”	Stimulates the integration of traumatic experience into a useful cognitive schema, supports prefrontal activity	Encourages post-traumatic growth, activates existential reflection and trust in the future

Source: The authors’ own conception

These parameters constitute part of a theoretical model proposed for future empirical investigation.Numerous local volunteer initiatives have been reported across Ukraine since the beginning of the full-scale invasion, although their characteristics differ between regions.

This activity may be accompanied by neuromodulatory processes involving dopaminergic and oxytocinergic pathways that have been associated with social bonding and reward processing.

The general three-component model of psychocorrection of sanogenic thinking presented in the table, through the combination of neuromotor, neurosensory, and neurosocial mechanisms, opens new possibilities for the integrative rehabilitation of youth traumatised by the war. The main principles of this approach are:

1. Neurosensory calming through tactile and auditory stimulation.
2. Neuromotor “grounding” through rhythmic manual work.
3. Social integration through cooperative communication and shared meaning of supporting the frontline.

This approach not only contributes to the restoration of an adaptive thinking pattern but also integrates traumatic experience into a new, constructive narrative identity, which is the foundation of psychological resilience in youth under the difficult conditions of the war.

Within the framework of the discussion on selecting valid techniques and strategies for mental health and stimulation of sanogenic thinking in youth, we must emphasise: Ukrainian researchers already possess practical experience closely related to our proposed neuro-pedagogical method of stimulating sanogenic thinking and psychohygienic competencies through neurosensory and neuromotor practices. Moreover, a number of such studies appeared in 2022, at the very beginning of the full-scale invasion. For example, Atamanchuk (2022) proposes methods of engaging in handicrafts that help reduce emotional tension in students. This corresponds to the neuromotor involvement component in the neuro-pedagogical method, where regular motor actions, such as needlework, stimulate the basal ganglia and form new behavioural regulation patterns.

On the other hand, Vysiatytska and Lysa (2024) study methods that include cognitive techniques and neurophysiological approaches to reduce anxiety and stress. This correlates with the sensory stimulation element in the neuro-pedagogical method, where the use of background monotonic or relaxation music promotes the harmonisation of the autonomic nervous system and reduces the hyperactivity of the sympathetic division.

Now it is essential to focus on the strategic, i.e., system-organisational, integrative, and large-scale resistance to war-related stressors with the help of the proposed methods. To integrate these techniques within the framework of a defined strategic vector, we propose our original approach to practical implementation within the concept of "dominant displacement". The theory of excitation dominance in the brain was developed by Ukhtomsky (2020). Dominance, in his concept, is a stable centre of increased neural activity that determines the dominant vector of cognitive, affective, and behavioural activity of the subject. According to this theory, excitation of certain neural centres gains priority over other neural structures, creating a functional asymmetry of brain processes (Ukhtomsky, 2020). It forms certain patterns of behavioural reactions and may have both adaptive and maladaptive effects depending on the content of the dominant mental constructs.

From the standpoint of modern cognitive neuropsychology, dominance is the neurophysiological substrate of long-term mental and emotional attitudes that are consolidated through frequent repetition of neural connections, known as Hebbian plasticity (Hebb, 1949). This means that frequent repetition of a certain type of thought and emotional reaction strengthens the corresponding neural networks, which in turn can contribute to either the development of constructive thinking (salutogenesis) or the deepening of pathogenic cognitive processes.

If we consider the concept of dominance from the standpoint of the neuro-pedagogy of sanogenic thinking, then a stable excitation centre of stressogenic origin may hinder effective cognitive, emotional, and behavioural adaptation. It can be neutralised either by gradual displacement or by fragmentation into smaller centres incapable of maintaining a pathological level of affective activity.

We see the strategy of implementing the methodological principles of the sanogenic approach within the concept of dominance in the following directions:

1. Deconstruction of the destructive dominance – carried out through gradual cognitive-emotional unloading, which changes thinking patterns.
2. Formation of a positive-cognitive alternative – restart of mental processes through the involvement of new reference groups and collective practices.
3. Sensory and motor integration – use of neuromotor and neurosensory practices that contribute to the reconfiguration of dominant neural ensembles.

The very method of neuromotor and neurosensory involvement of youth who have undergone psychological trauma from war requires a holistic and "simultaneous reorientation" of dominance. Therefore, one of the effective methods is the combination of fine motor skills, sensory stimulation, and cognitive-affective content of activity. For example, organising youth volunteer

groups to weave camouflage nets combines neuromotor therapy with positive psychology and sanogenic pedagogy.

The methodology further elaborates its basic elements by translating neurodynamic patterns into practical training contexts. Table 2 details how the deconstruction of destructive dominance is operationalised through specific didactic tracks within the established youth hubs.

Table 2. Predictive Model of Dominant Transformation under Volunteer Hub Conditions

Element of the Method	Description
Neuromotor Involvement	Regular repetitive motor actions that stimulate the basal ganglia and form new patterns of behavioural regulation.
Sensory Stimulation	Use of background monotonous or relaxation music to harmonise the autonomic nervous system and reduce sympathetic overactivity.
Social Interaction	Bringing participants together around shared values of self-preservation, solidarity, and victory, creating a cognitive-emotional synergistic effect.
Perceptual Focusing	Shifting attention from personal negative experiences to collectively meaningful activity, forming a new existential paradigm.

Source: The authors' own conception

These parameters form part of a theoretical model proposed for future empirical investigation.

Thus, the thinking and emotional background of participants in such cooperative social practices acquire an integrated sanogenic character, which promotes the restoration of psychological balance, strengthens cognitive flexibility, and increases stress resilience.

It is also necessary to proceed from the fact that strategic aspects lie in the domain of organisation. Therefore, we propose that education policymakers, heads of educational and public institutions, and local authorities participate in the creation of volunteer hubs, youth clubs, and integrative educational spaces that operate on the principles of cooperative psychotherapy and socio-cognitive resonance. The main hypothesis of further empirical research will consist in the assumption that ethically, patriotically, and existentially meaningful collective activity will become an effective tool for neurodynamic redirection of thinking precisely in such specially organised spaces.

8. Discussion

The results of modelling sanogenic thinking as a neurodynamic system suggest the need to reconsider the paradigm of "cognitive control" in education. Traditional approaches often require students to deliberately suppress emotions. According to neuropsychological evidence (Pessoa, 2017), this may overload the prefrontal cortex and reduce cognitive flexibility.

The proposed "dominant shift" model offers an alternative mechanism. It involves the use of sensorimotor activity (e.g., manual labour, rhythmic movement) to facilitate a natural downregulation of stress-related neural systems. This approach has particular relevance for the journal's focus on multidimensional education. The model suggests that learning under crisis conditions cannot be purely cognitive. Rather, it should integrate embodied and social experience. Its potential international applicability lies in its suitability for conflict-affected or disaster contexts. It does not require specialised equipment and relies on accessible resources such as social affiliation and simple sensorimotor activity.

Ethical considerations are also important. The implementation of sanogenic hubs should not lead to forced emotional optimisation. This may result in "toxic positivity". At the same time, the model's feasibility is supported by its low cost. This makes it potentially inclusive for regions with limited or damaged infrastructure.

The proposed hypotheses outline a framework for future research in multidimensional education and crisis psychology. Further empirical studies, including randomised controlled trials (RCTs), are needed to test these assumptions. This would allow the conceptual model of sanogenic thinking to be developed into an evidence-based neuropsychological rehabilitation framework. It may also have potential for international application in addressing mass trauma.

The proposed model remains predictive at this stage. The presented hypotheses require further verification through fMRI and biochemical analyses in future longitudinal studies.

9. Limitations and Prospects

Despite its conceptual novelty, the study has several limitations that require careful consideration.

First, the "healing neurosociety" model is grounded in a relatively high level of social solidarity observed in the Ukrainian context. In societies with lower levels of social trust, the effects of oxytocin-related modulation through group activities may be weaker.

Second, inadequate organisation of group work without professional psychological supervision may lead to secondary traumatisation. This may occur due to the uncontrolled discussion of traumatic experiences in group settings.

Third, although the proposed methods (e.g., needlework, music) are cost-effective, the establishment of safe and structured hubs requires considerable investment in logistics and personnel training (e.g., neuropedagogical staff). This may present challenges for countries with limited resources.

The main limitation of this study is its predictive-theoretical nature. The hypotheses regarding neurodynamic changes, including amygdala activity and cortisol levels, are intended as directions for future experimental research (randomised controlled trials, RCTs). They do not represent empirical findings reported in this manuscript.

10. Conclusion

The theoretical conclusion of the article is that within the context of the modern neurocentric paradigm, the category of sanogenic thinking is revealed not as a static individual resource, but as a dynamic cognitive-affective system capable of integrating metacognitive awareness, emotional self-regulation, and meaning-making reconceptualisation of traumatic experience. In this approach, sanogenic thinking is understood as cognitive immunity (Metcalfe & Finn, 2013), which ensures flexible balancing between automated stress reactions (such as amygdala activation) and neurocontrol by the prefrontal cortex, allowing the subject not only to adapt but also to transform the meaning of their experience.

Neuropsychological research (Davidson & McEwen, 2012) emphasises that cognitive reappraisal, as the core of sanogenic thinking, is supported by neuroplasticity and can be trained even under conditions of chronic stress.

However, within this paradigm, critical nuances also emerge: on the one hand, excessive reliance on cognitive control (Ochsner & Gross, 2005) may indeed reduce anxiety, but on the other hand (Pessoa, 2017), it can provoke cognitive exhaustion and decrease long-term resilience. Moreover, the popular idea of positive thinking as a tool of sanogenesis is criticised for excessively reducing the complexity of stress experiences (Hanley et al., 2015). Therefore, the modern conceptualisation of sanogenic thinking requires contextual depth and flexible alignment with social, cultural, and neurophysiological conditions. In this regard, the most promising approach is to interpret sanogenic thinking as a socially and neuropsychologically mediated cognitive process that unfolds in interaction with the environment and forms an epistemologically new strategy of education and psychological support for youth in conditions of catastrophe.

The practical result of the article lies in methodological conclusions, recommendations, methods, and a framework strategy. It conceptualises the restoration of psychological balance as a process of neuroplastic reconfiguration of dominant neuronal ensembles responsible for affective regulation, attention, and meaning-making. The key epistemological shift of this approach is the understanding of thinking not as abstract cognition but as an embodied and socially conditioned form of neurodynamic orientation, which can be reprogrammed through the integration of sensory, motor, and socio-affective stimuli. The dominant shift strategy involves the active redirection of pathologically entrenched stress thinking patterns by immersing the subject in a safe, shared,

meaning-making environment, where the effectiveness of motor and sensory techniques (rhythmic movements, handicrafts, music, cooperative labour) is ensured through the regulation of amygdala activity and the activation of the prefrontal cortex.

This is not only supported by empirical neuropsychological models (Davidson & McEwen, 2012; Porges, 2011) but also moves pedagogical interaction beyond instruction and control, transforming it into a psychoneurophysiological form of support that works not through cognitive persuasion, but through somatic synchronisation, empathic affiliation, and shared narrative transformation of experience. Thus, the proposed authorial model combines the strategic goal of shifting the dominant from destructive affects to sanogenic integrations with specific psychopedagogical tools that contribute to the restoration of adaptive neurodynamics, the development of social trust, and the cultivation of resilience as a systemic competence among youth during wartime.

It should also be noted that the presented framework strategy is based on the organisational-methodological integration of neuroscientific, cognitive, and behavioural approaches to stimulating sanogenic thinking in Ukrainian youth. It facilitates adaptation to military stressors, reduces anxiety levels, and promotes the development of self-regulation mechanisms. Future research should focus on the empirical testing of this methodology and the assessment of its long-term effects.

This manuscript presents a theoretical justification and research protocol. The absence of empirical data reflects its conceptual stage of development. The next phase of research will involve testing the proposed hypotheses through measurements of heart rate variability, cortisol levels, and fMRI scanning of volunteer hub participants.

The practical outcome of the article conceptualises the restoration of mental balance as a process of neuroplastic reconfiguration of dominant neural ensembles. It proposes a new conceptual framework of “dominant shift”. In this framework, thinking is understood as a bodily rooted form of neurodynamic orientation. The proposed model is falsifiable. It will be considered refuted if further empirical measurements (e.g., fMRI or EEG) do not reveal a statistically significant correlation between group-based sensorimotor activity and a reduction in affective reactivity in youth.

The systemic significance of the article for the journal’s audience lies in the argument that multidimensional education in conflict contexts is not limited to knowledge transfer. It also involves the embodied reorganisation of the learner’s neurodynamic state. The proposed “dominant shift” model is methodologically grounded in the principles of falsifiability. It also rests on the systemic relationship between neurobiology and pedagogy (Niyonsenga et al., 2025).

Statement on the Use of Artificial Intelligence

The authors acknowledge the use of AI-assisted tools solely for language editing and the enhancement of academic expression. All ideas, interpretations, analyses, and conclusions presented in the article remain the full responsibility of the authors.

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