Державний заклад

«Південноукраїнський національний педагогічний університет імені К. Д. Ушинського»

І. І. Савенкова, Г. С. Венгер, І. Г. Павлова, С. В. Сєвцов,

Я. В. Калужинський, Є. О. Убірія, В. О. Малигіна

ПСИХІЧНЕ ЗДОРОВ'Я ОСОБИСТОСТІ ЯК ПОЛІНАУКОВА ПРОБЛЕМА СУЧАСНОСТІ

Колективна монографія

за загальною і науковою редакцією доктора психологічних наук (19.00.04 – медична психологія), професора, лікаря-психолога вищої категорії І.І. Савенкової

Миколаїв

«Іліон»

2026

State Institution
South Ukrainian National Pedagogical University named after K. D. Ushynsky

I. I. Savenkova, H. S. Venher, I. H. Pavlova, S. V. Sievtsov,
Ya. V. Kaluzhynskyi, Ye. O. Ubiriia, V. O. Malyhina

MENTAL HEALTH OF THE INDIVIDUAL AS A POLYSCIENTIFIC PROBLEM OF THE PRESENT

Collective Monograph

under the general and scientific editorship of Doctor of Psychological Sciences (19.00.04 – Medical Psychology), Professor, Highest Qualification Category Medical Psychologist
I. I. Savenkova

Mykolaiv
“Ilion”
2026

УДК 612.821.1 DOI: https://doi.org/10.24195/SavenkovaMonograph2026

П

Рекомендовано до друку Вченою радою ДЗ «Південноукраїнський національний педагогічний університет імені К. Д. Ушинського»

(протокол № 15 від 25 червня 2026 року)

Рецензенти:

Садова М. А. - доктор психологічних наук, професор, професор кафедри психології Національного університету біоресурсів і природокористування України.

Астремська І.В. - доктор психологічних наук, доцент, доцент кафедри психології Чорноморського національного університету імені Петра Могили.

Шевченко Р.П. - доктор психологічних наук, професор, професор кафедри практичної психології Одеського національного морського університету.

Психічне здоров'я особистості як полінаукова проблема сучасності: ***колективна монографія*** / І. І. Савенкова, Г. С. Венгер, І. Г. Павлова, С. В. Сєвцов, Я. В. Калужинський, Є. О. Убірія, В.О. Малигіна / за загальною і науковою редакцією доктора психологічних наук (19.00.04 – медична психологія), професора, лікаря-психолога вищої категорії І.І. Савенкової. Миколаїв: Іліон, 2026. с.

ISBN

У монографії представлено результати п’ятирічних досліджень полінаукової проблеми психічного здоров'я та патопсихологічних механізмів його порушення внаслідок травматичних ушкоджень психіки, порушень адаптації, розладів комунікації. Висвітлено теоретико-методологічні аспекти патогенезу розладів адаптації, комунікації, мультимодальна природа емоційних переживань: від психосоматичної фіксації до нейропластичної реконструкції досвіду, зроблено акцент на соматичний вибір, а саме, психосоматичні прояви непрожитих емоцій. Запропоновано алгоритми психологічного супроводу осіб з порушеннями адаптації, зокрема психологічний супровід військовослужбовців з наслідками травматичного досвіду. Подано модель поетапної інтегративної психодіагностики нейрокогнітивної та психоемоційної сфери осіб з розладами адаптації та запропоновані шляхи психологічної реабілітації.

Подані матеріали можуть бути використані у процесі практичної діяльності клінічних психологів, практичних психологів, лікарів-психологів, психотерапевтів для оцінки етіопатогенетичних механізмів порушення психічного здоров'я різної категорії осіб з аномаліями розвитку, порушеннями комунікації та адаптації. Наукові здобутки можуть бути використані у процесі підготовки психологів зі спеціальності С4 Психологія для розроблення освітньо-професійних програм та навчально-методичних комплексів.

ISBN

UDC 612.821.1
P

Recommended for publication by the Academic Council of the State Institution South Ukrainian National Pedagogical University named after K. D. Ushynsky (Protocol No. 15 dated 25 June 2026)

Reviewers:

M. A. Sadova - Doctor of Psychological Sciences, Professor, Professor of the Department of Psychology, National University of Life and Environmental Sciences of Ukraine.

I. V. Astremska - Doctor of Psychological Sciences, Associate Professor, Associate Professor of the Department of Psychology, Petro Mohyla Black Sea National University.

R. P. Shevchenko - Doctor of Psychological Sciences, Professor, Professor of the Department of Practical Psychology, Odesa National Maritime University.

Mental Health of the Individual as a Polyscientific Problem of the Present: collective monograph / I. I. Savenkova, H. S. Venher, I. H. Pavlova, S. V. Sievtsov, Ya. V. Kaluzhynskyi, Ye. O. Ubiriia, V. O. Malyhina / under the general and scientific editorship of Doctor of Psychological Sciences (19.00.04 – Medical Psychology), Professor, Highest Qualification Category Medical Psychologist I. I. Savenkova. Mykolaiv: Ilion, 2026. p.

ISBN

The monograph presents the results of five years of research on the polyscientific problem of mental health and the pathopsychological mechanisms of its disturbance caused by traumatic psychic injuries, adaptation and communication disorders. Theoretical and methodological aspects of the pathogenesis of adaptation and communication disorders are highlighted, together with the multimodal nature of emotional experiences - from psychosomatic fixation to neuroplastic reconstruction of experience. Particular emphasis is placed on psychosomatic manifestations of unprocessed emotions. Algorithms for psychological support of individuals with adaptation disorders are proposed, including support for military personnel affected by traumatic experiences. A model of stage-based integrative psychodiagnostics and rehabilitation of the neurocognitive and psychoemotional spheres in individuals with adaptation disorders is presented. The materials may be used in the practical work of clinical psychologists, medical psychologists, and psychotherapists to assess etiopathogenetic mechanisms of mental health disturbances in individuals with developmental abnormalities, communication disorders, and adaptation disturbances. The findings may also be used in the training of psychologists within Specialty C4 Psychology for developing educational-professional programs and educational-methodological complexes.

ISBN

CONTENTS

Section 5. Venher Hanna

ПЕРЕДМОВА

У монографії позиціоновано результати планової науково-дослідної роботи кафедри клінічної психології та психічного здоров'я Південноукраїнського національного педагогічного університету імені К. Д. Ушинського в межах фундаментальних наукових досліджень на тему: «Психічне здоров'я особистості як полінаукова проблема сучасності» (державний реєстраційний номер 0122U00078).

В межах фундаментального наукового дослідження було впроваджено в практику *психологічну реабілітаційну програму* щодо виявлення та відновлення когнітивних порушень військовослужбовців військової частини (2023 р.); *методику* «Інформаційно-діагностичного підходу в психологічній реабілітації осіб зі стресовими розладами в умовах закладу охорони здоров'я під час воєнного стану» на базі Миколаївської міської лікарні (2024 р.), *психологічну реабілітаційну програму* щодо психологічного супроводу осіб юнацького віку при проявах стресового розладу в навчальну роботу для здобувачів вищої освіти (2024 р.); поетапну інтегративну *модель психодіагностики нейрокогнітивної та психоемоційної сфери осіб з розладами адаптації* в Психологічному центрі Ментального здоров'я (2026); *методику дослідження тривожних розладів у дітей з розладами аутистичного спектру* в Реабілітаційному центрі для дітей з особливими потребами (2026).

Тему наукового дослідження узгоджено з Концепцією розвитку охорони психічного здоров'я в Україні на період до 2030 року. В науковому дослідженні було поєднано основну проблему, яку потребує розв'язання ВООЗ, *психічне здоров'я як стан благополуччя,* при якому кожна людина може реалізувати власний потенціал та, водночас, в умовах війни, коли впоратися з повсякденними стресами стає неможливо, що потребує кваліфікованого психологічного супроводу осіб з наслідками травматичного досвіду. Таким чином програма фундаментального наукового дослідження розкриває роль *комплексного підходу до відновлення психічного здоров'я різних верст населення та вікових груп,* надає рекомендації щодо роботи психолога в мультидисциплінарній команді задля вирішення найактуальнішої полінаукової проблеми сучасності – *психічне здоров'я особистості.*

PREFACE

This monograph presents the results of the planned research activity of the Department of Clinical Psychology and Mental Health at South Ukrainian National Pedagogical University named after K. D. Ushynsky, conducted within the framework of the fundamental research project "Mental Health of the Individual as a Polyscientific Problem of the Present" (*state registration No. 0122U00078*).

Within this fundamental research project, the following were implemented in practice: a psychological rehabilitation program for the identification and restoration of cognitive impairments in military personnel of a military unit (2023); the methodology "Information-Diagnostic Approach in the Psychological Rehabilitation of Individuals with Stress Disorders in Healthcare Settings under Martial Law" at the Mykolaiv City Hospital (2024); a psychological rehabilitation program for the psychological support of adolescents with manifestations of stress disorders, integrated into the educational process for higher education students (2024); a stage-based integrative model of psychodiagnostics of the neurocognitive and psychoemotional domains in individuals with adjustment disorders at the Psychological Center for Mental Health (2026); a methodology for the assessment of anxiety disorders in children with autism spectrum disorders at a rehabilitation center for children with special needs (2026).

The research topic is aligned with the Concept for the Development of Mental Health Care in Ukraine up to 2030. The study integrates a key issue emphasized by the World Health Organization—mental health as a state of well-being in which individuals can realize their potential—with the realities of wartime conditions, where coping with everyday stressors becomes significantly impaired and requires qualified psychological support for individuals affected by traumatic experiences.

Thus, the program of fundamental research highlights the role of a comprehensive approach to restoring mental health across different population groups and age categories, and provides recommendations for psychologists working within multidisciplinary teams to address one of the most pressing polyscientific problems of the present: the mental health of the individual.

Психічне здоров'я особистості як полінаукова проблема сучасності

ВСТУП

Колективна монографія враховує результат наукової діяльності кафедри протягом п'яти років, спрямований на забезпечення здоров'я та якості життя українського суспільства в умовах війни та післявоєнний період.

У колективній монографії представлено результати *п'ятирічних досліджень полінаукової проблеми психічного здоров'я та патопсихологічних механізмів його порушення* внаслідок травматичних ушкоджень психіки, порушень адаптації, розладів комунікації. Висвітлено теоретико-методологічні аспекти патогенезу розладів адаптації та комунікації, мультимодальна природа емоційних переживань: від психосоматичної фіксації до нейропластичної реконструкції досвіду, зроблено акцент на соматичний вибір, а саме, психосоматичні прояви непрожитих емоцій. Запропоновано алгоритми психологічного супроводу осіб з порушеннями адаптації, зокрема психологічний супровід військовослужбовців з наслідками травматичного досвіду. Подано модель поетапної інтегративної психодіагностики нейрокогнітивної та психоемоційної сфери осіб з розладами адаптації та запропоновані шляхи психологічної реабілітації. Визначено і обґрунтовано методологічні підходи дослідження проблеми психічного здоров'я особистості з урахуванням екстремальних та надзвичайних умов у загальному процесі життєдіяльності суспільства; розроблено модель прогнозування психічного здоров'я особистості. Обґрунтовано аналіз застосування новітніх підходів до нормалізації психічного здоров'я особистості в практичній сфері роботи з постраждалими та військовослужбовцями. Висвітлено теоретико-методологічні аспекти застосування прогностичних показників прояву тривожності у дітей з розладами аутистичного спектру.

Основні компоненти проблеми в царині охорони психічного здоров'я в Україні, на що було *спрямоване фундаментальне наукове дослідження:*

- недостатня обізнаність щодо психічного здоров'я у суспільстві, яка призводить до стигматизації та несвоєчасного звернення за професійною допомогою;

- брак системи профілактики психічних розладів, що базується на фактичних даних, та ефективної популяризації психічного здоров'я;

- низький рівень кадрового забезпечення психологами, психотерапевтами, соціальними працівниками та іншим персоналом, який залучається до надання допомоги у галузі психічного здоров'я, недостатність системи формування та підтримки професійних компетентностей серед фахівців цієї сфери та інших суміжних професій;

- надмірна зосередженість допомоги у сфері психічного здоров’я у спеціалізованих закладах охорони здоров’я та інтернатних закладах системи соціального захисту;

- низька доступність психологічної та психотерапевтичної допомоги;

- дефіцит служб, які б базувалися на рівні територіальних громад, реабілітаційних і соціальних послуг;

- брак ефективної системи допомоги родинам, які доглядають осіб із психічними захворюваннями, а також недостатній розвиток кризової психологічної підтримки та програм раннього втручання на рівні територіальних громад;

- обмежене використання сучасних технологій, методів і процедур оцінювання у сфері психічного здоров’я та надання помочі особам із проблемами психічного здоров’я під час первинної медичної до-помоги;

- недостатня диференційованість отримання підтримки у сфері охорони психічного здоров’я з урахуванням чутливості до потреб різних груп суспільства, а також обмежена участь і залучення осіб із психічни-ми та інтелектуальними порушеннями і членів їхніх сімей до планування допомоги, її реалізації та оцінювання.

Пошук розв’язання компонентів проблеми психічного здоров'я дозволив:

- розробити поетапну інтегративну модель психодіагностики нейрокогнітивної та психоемоційної сфери осіб з розладами адаптації та розробити шляхи їх психологічної реабілітації (автори – Савенкова І.І., Сєвцов С.В.);

- розробити модель мультимодальної природи емоційних переживань: від психосоматичної фіксації до нейропластичної реконструкції досвіду в роботі з психосоматичними розладами (автори – Савенкова І.І., Малигіна В.О.);

- розробити методику психодіагностики тривожних розладів у дітей аутистичного спектру та шляхи їх реабілітації (автори – Савенкова І.І., Убірія Є.О.);

- запропонувати шляхи психологічного супроводу осіб з порушенням психічного здоров'я внаслідок органічного ураження центральної нервової системи та впровадження реабілітаційних заходів (автори Павлова І.Г., Калужинський Я.В.).

- запропонувати програму психологічного супроводу військовослужбовців задля підтримки емоційно-вольової сфери в умовах сьогодення (автор – Венгер Г.С.).

INTRODUCTION

This collective monograph reflects the results of five years of scientific activity of the department, aimed at promoting health and quality of life in Ukrainian society under conditions of war and in the post-war period.

The monograph presents the outcomes of five years of research into the polyscientific problem of mental health and the pathopsychological mechanisms underlying its disturbances due to traumatic psychological injury, maladaptation, and communication disorders.

The following aspects are addressed: theoretical and methodological foundations of the pathogenesis of adjustment and communication disorders; the multimodal nature of emotional experience—from psychosomatic fixation to neuroplastic reconstruction of experience; emphasis on somatic choice, particularly psychosomatic manifestations of unprocessed emotional experiences.

The monograph proposes: algorithms for psychological support of individuals with adjustment disorders, including military personnel affected by traumatic experiences; a stage-based integrative model of psychodiagnostics of neurocognitive and psychoemotional functioning in individuals with adjustment disorders; pathways for psychological rehabilitation.

Methodological approaches to studying mental health are defined and substantiated, taking into account extreme and emergency conditions within the broader context of societal functioning. A model for predicting individual mental health is also developed.

The application of modern approaches to the normalization of mental health in practical work with affected populations and military personnel is justified. Additionally, theoretical and methodological aspects of predictive indicators of anxiety manifestations in children with autism spectrum disorders are presented.

Key Problem Components in the Field of Mental Health Care in Ukraine

The fundamental research addressed the following systemic challenges:

- insufficient public awareness of mental health, leading to stigma and delayed help-seeking;

- lack of evidence-based prevention systems and effective mental health promotion; shortage of qualified personnel (psychologists, psychotherapists, social workers) and insufficient systems for developing and maintaining professional competencies;

- excessive concentration of mental health care within specialized institutions;

- limited accessibility of psychological and psychotherapeutic services;

- shortage of community-based services, rehabilitation, and social support systems;

- insufficient support systems for families caring for individuals with mental disorders, as well as underdeveloped crisis intervention and early intervention programs at the community level; limited use of modern technologies, assessment methods, and procedures in mental health care, particularly in primary care settings;

- insufficient differentiation of support services according to the needs of diverse population groups, and limited involvement of individuals with mental and intellectual disorders and their families in planning, implementation, and evaluation of care.

Addressing these challenges led to:

- the development of a stage-based integrative model of psychodiagnostics of neurocognitive and psychoemotional domains in individuals with adjustment disorders, and corresponding rehabilitation pathways (I. Savenkova, S. Sievtsov);

- the development of a model of the multimodal nature of emotional experience—from psychosomatic fixation to neuroplastic reconstruction in the treatment of psychosomatic disorders (I. Savenkova, V. Malyhina);

- the development of a methodology for diagnosing anxiety disorders in children with autism spectrum disorders and their rehabilitation (I. Savenkova, Ye. Ubiria);

- proposals for psychological support of individuals with mental health disorders due to organic central nervous system damage, including rehabilitation strategies (I. Pavlova, Ya. Kaluzhynskyi);

- a program of psychological support for military personnel aimed at maintaining emotional-volitional functioning under current conditions (H. Venger).

Section 1

Savenkova Iryna, Sievtsov Sergii

STAGE-BASED INTEGRATIVE NEUROCOGNITIVE AND PSYCHOEMOTIONAL ASSESSMENT AND REHABILITATION OF INDIVIDUALS WITH ADJUSTMENT DISORDERS

1.1. Introduction

Adjustment disorders represent one of the most clinically prevalent yet conceptually under-structured categories within contemporary clinical psychology and mental health practice [1]. They are characterized by subjective distress following exposure to a significant stressor, a disruption of everyday functioning and a persistent inability to adapt effectively to changing life conditions [2]. Despite advances in diagnostic classification systems, including ICD-11, the conceptualization of adjustment disorders remains largely focused on symptom description [3] rather than on structured models of psychological rehabilitation.

Existing approaches to intervention are often derived from broader therapeutic traditions and tend to emphasize symptom reduction, emotional support, or coping enhancement without a clearly articulated process model that explains how psychological adaptation is restored over time. As a result, clinical practice frequently lacks a unified framework that integrates assessment, intervention, and process monitoring into a coherent system.

A central limitation of symptom-oriented approaches is that they do not fully capture the dynamic nature of maladaptation. In adjustment disorders, the core difficulty is not limited to the presence of anxiety, depressive affect, impaired impulse regulation, and patterns of fixation or avoidance, but also reflects a disruption in the individual's capacity to maintain goal-directed functioning and subjective agency under conditions of stress. This suggests that effective rehabilitation requires not only the reduction of distress, but also the restoration of long-term adaptive functioning across cognitive, emotional, and behavioral domains.

In this context, there is a growing need for models that conceptualize psychological rehabilitation as a structured process involving changes in modes of functioning, rather than as a collection of isolated techniques. Such models should be sensitive to multiple levels of psychological regulation, allow for operationalization in clinical protocols, and support empirical investigation of both outcomes and underlying mechanisms.

The present chapter proposes a stage-based integrative framework for neurocognitive and psychoemotional assessment and rehabilitation in individuals with adjustment disorders. The model is based on the assumption that overcoming maladaptation involves a progressive reorganization of psychological functioning, which can be described in terms of successive stages and operationalized through a system of functional modules.

At the same time, the approach extends beyond purely stage-based logic by incorporating three interconnected regulatory levels: modulatory, analytical, and process-oriented. These levels reflect different layers of psychological organization, ranging from basic regulation of states and actions to higher-order processes of agency, self-reflection, and metacognitive integration.

A key feature of the proposed framework is the integration of multiple domains of assessment into a unified clinical pathway. The approach includes differential diagnostic screening, neuropsychological assessment of cognitive accessibility, evaluation of adjustment disorder symptoms using the ADNM-20, WSAS and assessment of coping patterns using the Brief COPE inventory. This multi-level assessment allows for a more precise understanding of the mechanisms underlying maladaptation and informs the selection of appropriate intervention strategies.

Psychological rehabilitation within this model is organized around a system of fifteen functional modules, each representing a specific type of therapeutic work. These modules are distributed across the three regulatory levels and can be flexibly combined depending on the clinical presentation. The rehabilitation process is conducted in relation to specific stressors, with each stressor representing a distinct cycle of adaptive work.

In addition to outcome assessment, the model introduces a process-oriented perspective through session-by-session monitoring of module engagement. This allows for the analysis of how specific therapeutic components are involved in the rehabilitation process and how they relate to changes in coping patterns and symptom severity.

Finally, the framework emphasizes that rehabilitation involves the acquisition of adaptive skills and the development of stable self-regulation mechanisms. This perspective positions psychological rehabilitation as a process of restoring functional capacity and agency, rather than merely alleviating distress.

The proposed model is intended as a conceptual and methodological basis for structuring clinical practice, training specialists, and conducting future empirical research on the mechanisms of psychological adaptation and recovery in adjustment disorders.

1.2. Psychological Adaptation and Maladaptation in Adjustment Disorders

Psychological adaptation in the context of adjustment disorders can be understood as the capacity of the individual to maintain goal-directed functioning, internal coherence, and subjective agency under conditions of increased environmental demands or stress [4]. Importantly, psychological adaptation should not be reduced to passive accommodation or mere habituation to adverse circumstances. Rather, it reflects an active regulatory process through which cognitive, emotional, and behavioral systems remain sufficiently organized to support meaningful action, decision-making, and alignment with personally significant values and goals.

From this perspective, psychological adaptation involves the preservation of functional integrity across multiple levels of psychological organization. At the behavioral level, it is expressed in the ability to act, initiate, and sustain activity despite situational difficulty. At the cognitive level, it includes the capacity to process information, maintain attention, construct coherent representations of the situation, and generate alternative courses of action. At the emotional level, adaptation implies the regulation of affect in a way that does not overwhelm the system or lead to persistent

dysregulation. At the level of subjectivity, it is reflected in the ability to experience oneself as an agent capable of influencing one's situation and making meaningful choices.

In contrast, psychological maladaptation represents a state or process in which the demands of the situation exceed the current regulatory capacity of the individual, resulting in a breakdown of functional organization [5]. This breakdown is not adequately described solely in terms of symptom intensity. Rather, it manifests as a disruption in the coordination between cognitive, emotional, and behavioral systems, leading to reduced cognitive flexibility, narrowed behavioral repertoire, and diminished effectiveness of action.

Clinically, maladaptation in adjustment disorders is typically expressed through several interrelated domains. These include persistent preoccupation with the stressor, often accompanied by repetitive and unproductive cognitive activity; avoidance of situations, decisions, or actions associated with the stressor; heightened negative affect, including anxiety, depressive mood, or irritability; and impairment in everyday functioning across domains such as work, social interaction, and self-organization [6]. These manifestations reflect not only emotional distress but also a loss of adaptive regulation.

A critical distinction should be made between acute stress reactions and maladaptation. Short-term stress responses may involve increased arousal, emotional intensity, or temporary disruption of functioning, but they can also serve adaptive and mobilizing functions [7]. Psychological maladaptation, by contrast, is characterized by persistence, rigidity, and functional impairment. It represents a failure of the system to reorganize in response to changing demands, resulting in a prolonged mismatch between situational requirements and available regulatory resources.

From a process-oriented perspective, psychological maladaptation can be conceptualized as a disruption in the dynamic balance between environmental demands and internal regulatory mechanisms. This imbalance may arise from several sources, including excessive stress load, insufficient coping resources, impaired cognitive accessibility, rigid motivational structures, or limitations in reflective and

metacognitive capacities. Importantly, these factors do not operate in isolation but interact across different levels of psychological functioning.

This multi-level understanding of psychological adaptation and maladaptation provides the conceptual foundation for the integrative model proposed in this chapter. It supports the assumption that effective rehabilitation must address not only symptoms but also the underlying organization of psychological functioning. In particular, it highlights the need to differentiate between deficits at the level of basic regulation, distortions in motivational and conflict-related processes, and limitations in subjectivity and agency.

Accordingly, the present framework conceptualizes psychological rehabilitation as a structured process aimed at restoring adaptive functioning through targeted interventions at different regulatory levels. This involves not only reducing distress but also re-establishing cognitive accessibility, reorganizing motivational structures, and strengthening the individual's capacity for reflective awareness and intentional action.

Within this approach, psychological adaptation is viewed as a dynamic and reconstructive process rather than a static outcome. The goal of psychological rehabilitation is not to eliminate all forms of stress or difficulty, but to enable the individual to engage with challenges in a flexible, coherent, and agentic manner. This shift from symptom reduction to functional restoration, within clinically realistic limits, forms the basis for the stage-based and level-oriented model of rehabilitation described in the following sections.

1.3. General Architecture of the Stage-Based Integrative Model

The stage-based integrative model of neurocognitive and psychoemotional assessment and rehabilitation is designed as a structured framework for understanding and organizing the process of psychological change in individuals with adjustment disorders. The model is grounded in the assumption that overcoming psychological maladaptation requires a progressive reorganization of psychological functioning,

which unfolds through identifiable phases and can be operationalized in clinical practice.

At its most general level, the model retains a stage-based logic of change, consisting of five successive phases: Discourse, Reflection, Integration, Formation, and Transformation. These stages describe the typical progression of psychological work, from the initial organization of experience to the consolidation of new patterns of functioning. However, in the present framework, stages are not treated as rigid or strictly linear sequences. Instead, they represent dominant modes of functioning that may overlap, recur, or partially regress depending on the clinical dynamics.

While the stage-based perspective captures the temporal dimension of change, it is not sufficient on its own to describe the internal structure of psychological functioning. For this reason, the model introduces a second organizing principle: three interconnected regulatory levels. These levels reflect qualitatively different layers of psychological organization and provide a more precise basis for the analysis and implementation of therapeutic work.

The first level, modulatory, refers to the basic organization of states and actions. It includes processes related to physiological stabilization, activation, compensation, repetition, and automation. This level is primarily concerned with the capacity to act, maintain activity, and regulate arousal and energy in a way that supports functional engagement with the environment.

The second level, analytical, encompasses the organization of motives, internal conflicts, values, and introjects. It involves processes through which individuals interpret their experiences, differentiate between internal and external demands, resolve motivational tensions, and develop a sense of ownership over their decisions and actions. Dysfunctions at this level often manifest as internal conflict, rigid "should"-based regulation, avoidance driven by implicit fears, or unstable commitment to chosen courses of action.

The third level, process–oriented regulation, refers to higher-order capacities related to subjectivity, conscious goal-directed agency, and metacognitive functioning. It includes the ability to take a reflective stance toward one's own experience, maintain

contact with reality without defensive distortion, integrate different aspects of the self, and act as an intentional agent in complex and uncertain situations. This level is critical for the development of flexible and sustainable psychological adaptation.

Within this framework, psychological rehabilitation is operationalized through a system of fifteen functional modules (five stages and three levels). Each module represents a specific type of therapeutic work defined by its clinical function, target processes, and expected outcomes. Importantly, modules are not tied exclusively to stages but are distributed across the three regulatory levels. This allows for a more flexible and individualized organization of the therapeutic process.

At the modulatory level, modules are primarily oriented toward stabilization, activation, compensation, repetition, and automation of behavior. At the analytical level, modules focus on validation, interpretation, separation, agency, and realization. At the process–oriented level, modules include confrontation, actualization, congruence, experimentation, and individuation. This level-based organization reflects the assumption that effective rehabilitation requires coordinated work across different layers of psychological functioning rather than progression through a single linear sequence.

The integration of stage-based and level-based perspectives allows the model to capture both the temporal and structural dimensions of psychological change. Stages describe how the process unfolds over time, while levels specify what type of therapeutic intervention is being conducted at any given point. In clinical practice, this means that a therapist may operate within a particular stage while engaging modules from different regulatory levels, depending on the needs and capacities of the individual.

A further defining feature of the model is its focus on stressor-specific cycles of rehabilitation. Rather than conceptualizing change as a global transformation of personality, the framework assumes that psychological adaptation is reconstructed in relation to specific stressors or problem domains. Each stressor may require its own cycle of work, involving different configurations of modules and varying durations of stages.

Finally, the model is designed to be operationalizable and compatible with psychological assessment. Each module can be identified, described, and monitored within therapeutic sessions, allowing for the tracking of module engagement over time. This creates the possibility of linking specific therapeutic processes to changes in coping patterns and symptom dynamics, thereby bridging the gap between conceptual models and empirical investigation.

In sum, the general architecture of the stage-based integrative model is defined by the combination of a (1) stage-based logic of psychological change, (2) a level-based organization of regulatory processes, and (3) a modular system of therapeutic interventions. This multi-dimensional structure provides a flexible yet structured framework for the assessment and rehabilitation of individuals with adjustment disorders and serves as the foundation for the more detailed descriptions presented in the following sections.

1.4. Diagnostic and Selection Framework

Effective psychological rehabilitation in adjustment disorders requires a clearly structured diagnostic and selection framework that allows differentiation between maladaptation as a primary condition and maladaptive symptoms secondary to other clinical disorders [8]. Without such differentiation, observed changes during intervention may be misattributed, reducing both clinical precision and the validity of outcome interpretation.

The proposed framework integrates differential diagnostic screening, neuropsychological assessment, and clinical exclusion criteria into a unified pre-intervention stage. This stage serves as a necessary condition for the appropriate application of the stage-based modular rehabilitation model.

Adjustment disorder, as defined in contemporary diagnostic systems, occupies a boundary position between normative stress reactions and clinically significant psychopathology [9]. One of the central methodological challenges in both clinical

practice and research is to ensure that maladaptive manifestations are not primarily driven by other dominant disorders.

To address this, the present framework incorporates standardized screening instruments aimed at identifying the presence of clinically significant anxiety, depressive, or post-traumatic symptomatology that may require alternative or prioritized intervention.

The Generalized Anxiety Disorder scale (GAD-7) [10] is used to assess the severity of anxiety symptoms and to exclude cases in which generalized anxiety disorder constitutes the primary clinical condition. The Patient Health Questionnaire (PHQ-9) [11] is applied to screen for depressive symptomatology and to identify cases consistent with a major depressive episode. The PTSD Checklist for DSM-5 (PCL-5) [12] is used to assess post-traumatic stress symptoms and to exclude cases in which a full PTSD syndrome is present.

The purpose of this screening is not to eliminate all comorbid symptoms, which are common in adjustment disorders, but to ensure that adjustment disorder remains the dominant clinical framework for interpretation and intervention. In cases where another disorder clearly constitutes the primary condition, alternative treatment protocols should be considered.

A central component of the proposed framework is the inclusion of neuropsychological assessment as a means of evaluating cognitive accessibility and determining the individual's functional capacity for reflective, goal-directed, and emotionally regulated work. Although adjustment disorders are not defined by structural cognitive impairment, stress-related dysregulation may significantly affect cognitive functioning at a functional level [13]. In the current war context, this issue becomes especially important in a subgroup of patients (particularly military personnel) with possible post-concussion syndrome following blast-related mild traumatic brain injury [14]. In such cases, difficulties that initially appear to be purely emotional or motivational may in fact be compounded by neurocognitive slowing, reduced attentional control, impaired working memory, or decreased executive efficiency.

For this reason, neuropsychological assessment within the present model is not limited to general cognitive screening. It is used to clarify whether the individual is cognitively available for analytical and process-oriented therapeutic work, or whether the initial emphasis should be placed on modulatory-level interventions and activation of basic cognitive and executive functions. In this framework, activation should not be understood primarily as cognitive training or teaching, but as the functional re-engagement of cognitive systems that may be temporarily suppressed, dysregulated, or inefficient under conditions of stress, exhaustion, or post-concussive impairment.

The first step in this assessment is the evaluation of general cognitive accessibility. The Montreal Cognitive Assessment (MoCA) [15] is used as a brief screening instrument to identify cognitive deficits that may interfere with the rehabilitation process. At this stage, it is essential to establish whether the patient can adequately perceive instructions, sustain basic attention, retain information long enough to perform simple tasks, and produce coherent verbal or motor responses. In practice, this stage helps determine whether further executive assessment will be informative or whether disturbances in more basic cognitive functions make such testing premature or insufficiently interpretable.

Beyond general screening, the assessment focuses on domains that are especially relevant in stress-related conditions and post-concussive states: attention, processing speed, inhibitory control, working memory, cognitive flexibility, verbal and visuospatial memory, visuoconstructive organization, abstract reasoning, and higher-order executive control. These domains are critical for engagement in reflective processes, decision-making, behavioral planning, and adaptive self-regulation. Executive functions are organized hierarchically, with higher-order processes building upon core components such as inhibitory control, working memory, and cognitive flexibility [16].

Inhibitory control is assessed using the Stroop Test [17], particularly in its classical Golden version, as a measure of the ability to inhibit automatic responses under conditions of interference. This is especially relevant in patients who present with distractibility, impulsive responding, or difficulty suppressing automatic reactions.

Working memory and sustained mental control are evaluated through both structured testing and clinical observation. Within the present battery, working memory is assessed using components of CNS Vital Signs [18], including task conditions that require the active maintenance, updating, and manipulation of information under continuous cognitive load. These measures allow for the evaluation of the individual's capacity to hold task-relevant information online while simultaneously responding to changing demands. In addition, working memory limitations often become evident during clinical interaction, manifesting as difficulty retaining instructions, losing track of task conditions, or inability to manage multistep operations. From a neuropsychological perspective, working memory is not limited to temporary storage, but reflects an active executive system responsible for maintaining and manipulating information in the service of goal-directed behavior [19]. In patients with suspected post-concussion syndrome, reduced working memory capacity frequently presents as cognitive fatigue, fragmentation of thought, and decreased ability to sustain organized goal-directed activity.

Verbal learning and memory are assessed using the Hopkins Verbal Learning Test–Revised (HVLT-R) [20], while visuospatial learning and memory are evaluated using the Brief Visuospatial Memory Test–Revised (BVMT-R) [21]. These instruments are particularly useful in distinguishing between primary executive disorganization and memory-related difficulties, both of which may affect the patient's capacity to benefit from rehabilitation.

The Rey–Osterrieth Complex Figure (ROCF) [22] is included to assess visuoconstructive abilities, visual organization, planning, and visual memory. Its value within the present framework lies not only in quantitative performance, but also in the qualitative analysis of task approach, whether the individual demonstrates organized, strategic behavior or fragmented, impulsive responding, providing insight into executive control in action.

Abstract reasoning and nonverbal analytical capacity are assessed using Raven's Progressive Matrices [23]. This allows for the estimation of preserved reasoning ability with minimal dependence on language and acquired knowledge, which is particularly

important in differentiating structural cognitive decline from temporary inefficiency associated with stress or post-concussive symptoms.

Frontal executive functioning may be additionally screened using the Frontal Assessment Battery (FAB) [24], which provides a brief clinical measure of conceptualization, mental flexibility, motor programming, sensitivity to interference, inhibitory control, and environmental autonomy. Within this framework, FAB serves as an intermediate step between global screening and more differentiated executive testing.

Where more detailed assessment is required, the battery includes the Twenty Questions subtest from the Delis–Kaplan Executive Function System [25] and the Wisconsin Card Sorting Test (WCST) [26]. The Twenty Questions task is informative for evaluating hypothesis generation, conceptual organization, and strategic search processes. The WCST provides a robust assessment of higher-order executive functioning, including rule acquisition, cognitive flexibility, error-based learning, and the ability to modify behavior in response to feedback. This is particularly relevant in patients demonstrating perseveration, reduced adaptability, or impaired strategic control.

Importantly, the interpretation of neuropsychological assessment in this model is not limited to psychometric scores. Test performance is considered in conjunction with behavioral observation, fatigue, emotional state, and task persistence. In both military and civilian populations affected by war-related trauma, factors such as anxiety, hyperarousal, emotional instability, and exhaustion may significantly influence cognitive performance. Therefore, test results must be interpreted within the broader clinical context.

The assessment of cognitive accessibility plays a crucial role in determining the appropriate entry point into the rehabilitation process. Individuals with reduced cognitive accessibility, particularly those with post-concussive symptoms such as slowed thinking, impaired concentration, and forgetfulness, may require an initial emphasis on modulatory-level interventions and activation of basic cognitive and executive functions before engaging in analytical or process-oriented work.

Conversely, individuals with preserved cognitive functioning may be able to engage more directly in higher-level modules.

Thus, within the proposed framework, neuropsychological assessment functions not merely as a diagnostic tool, but as a clinical guide for understanding the individual's current level of cognitive organization and for structuring the sequence, depth, and focus of therapeutic interventions accordingly.

In addition to standardized screening, the framework incorporates clinical exclusion criteria based on structured or semi-structured interview. These criteria are essential for identifying conditions that require alternative or prioritized clinical management and for ensuring the safety and appropriateness of the rehabilitation process.

The primary exclusion criteria include the presence of psychotic symptoms, active substance dependence, and acute suicidal states. Psychotic conditions may significantly distort perception of reality and impair the capacity for reflective and goal-directed work [27], making the application of the proposed model clinically inappropriate without prior stabilization within a psychiatric framework.

Active substance dependence represents a distinct clinical condition characterized by altered motivational and regulatory processes [28], which may interfere with the implementation of structured psychological rehabilitation. In such cases, specialized addiction-focused interventions are required as a primary line of treatment.

Acute suicidal states constitute a clinical emergency and require immediate risk management and safety planning, often within a multidisciplinary or psychiatric setting [29]. The application of a structured rehabilitation model in such conditions must be postponed until stabilization is achieved.

The inclusion of these exclusion criteria is not intended to restrict the applicability of the model but to ensure that it is used within appropriate clinical boundaries. This enhances both the safety of the intervention and the validity of subsequent assessment of outcomes.

1.5. Baseline Assessment of Symptoms and Coping

A central principle of the proposed framework is the integration of symptom-oriented and process-oriented assessment into a unified structure. In the context of adjustment disorders, this requires not only the evaluation of maladaptive symptomatology but also an understanding of how the individual attempts to cope with the stressor. For this purpose, the model incorporates two primary baseline assessment tools: the Adjustment Disorder–New Module questionnaire (ADNM-20) [30] and the Brief COPE inventory [31].

These instruments serve different but complementary functions. ADNM-20 provides a structured measure of maladaptation associated with a specific stressor, while Brief COPE offers a descriptive profile of coping strategies that may influence the development and maintenance of maladaptive responses. Together, they form a dual-axis assessment system that captures both the severity of maladaptation and the organization of coping behavior at the beginning of the rehabilitation process.

Assessment of Adjustment Disorder Symptoms (ADNM-20)

The ADNM-20 is used as the primary instrument for assessing the severity and structure of adjustment disorder symptoms. It is administered in relation to a clearly identified stressor and allows for the evaluation of core domains associated with maladaptation.

These domains typically include persistent preoccupation with the stressor, avoidance of stressor-related stimuli or actions, negative affect (such as anxiety, depressive mood, or irritability), and disturbances in functioning. Importantly, the instrument captures not only the presence of distress but also the degree to which maladaptive processes interfere with everyday life.

Within the present framework, the ADNM-20 serves several functions. First, it establishes a baseline level of maladaptation prior to the initiation of rehabilitation. Second, it provides a structured way of linking subjective experience to specific symptom domains, which can inform the initial focus of therapeutic work. Third, it

allows for subsequent comparison with post-intervention scores, enabling the evaluation of changes in symptom severity over the course of the rehabilitation process.

The use of ADNM-20 is consistent with the conceptualization of adjustment disorder as a condition defined not only by emotional distress but also by impaired adaptation. Therefore, changes in ADNM-20 scores are interpreted as indicators of progress in overcoming maladaptation rather than merely reductions in isolated symptoms.

Although the ADNM-20 includes several items related to functional impairment, these are embedded within the broader structure of maladaptive symptomatology. For this reason, the Work and Social Adjustment Scale (WSAS) [32] is included to assess functional impairment as a distinct outcome domain. This distinction allows for a more precise evaluation of rehabilitation effects, particularly in cases where reductions in subjective distress are not accompanied by proportional improvements in everyday functioning.

Assessment of Coping Patterns (Brief COPE)

While ADNM-20 captures the outcome-related dimension of maladaptation, it does not provide direct information about how the individual attempts to manage the stressor. To address this limitation, the proposed framework incorporates the Brief COPE inventory as a tool for assessing coping patterns at baseline and during the rehabilitation process.

Brief COPE is used to identify dominant coping tendencies, including both adaptive and potentially maladaptive strategies. These may include, for example, active coping, planning, seeking emotional or instrumental support, as well as avoidance-based strategies such as denial, behavioral disengagement, or self-distraction.

Within this model, coping is not treated as a static trait but as a dynamic system of responses that may change throughout the rehabilitation process. The baseline assessment provides an initial profile of how the individual interacts with the stressor at the level of behavior, cognition, and emotion. This profile can help to identify patterns that may contribute to the maintenance of maladaptation, such as rigid avoidance, excessive rumination, or reliance on passive strategies.

Importantly, the role of Brief COPE in this framework is primarily descriptive and process-oriented rather than diagnostic. The instrument is used to map coping tendencies that may later be examined in relation to the engagement of specific modules and changes in symptomatology. This creates the possibility of analyzing how shifts in coping patterns correspond to different phases and components of the rehabilitation process.

Repeated administration of Brief COPE during or after the intervention allows for the assessment of changes in coping organization. Such changes may include increased flexibility, greater use of active or problem-focused strategies, and reduced reliance on avoidant or dysregulating patterns. These shifts are considered an important aspect of psychological adaptation and may serve as intermediate indicators of therapeutic progress.

1.6. Stage-Based Modular Rehabilitation Framework

Following baseline assessment, psychological rehabilitation within the proposed model is organized as a structured, stage-based process implemented through a system of functional modules. The central assumption is that overcoming psychological maladaptation is not achieved through isolated interventions, but through a coordinated sequence of changes in psychological functioning that unfold in relation to a specific stressor.

Rehabilitation is conducted separately for each clinically significant stressor. Each stressor represents a distinct domain of maladaptation and defines a corresponding "problem zone," within which symptoms, coping patterns, and functional impairments are assessed and addressed. This stressor-specific organization allows for a precise alignment between assessment, intervention, and outcome evaluation.

The framework is based on three core principles. First, rehabilitation follows a stage-based progression. Therapeutic work unfolds through five stages: Discourse (initial organization of lived experience through language and interpersonal contact), Reflection (conscious cognitive processing and interpretation of experience), Integration (incorporation of interpreted experience into the self-structure with

restoration of internal coherence), Formation (transition from internal change to goal-directed action and the formation of new behavioral patterns), and Transformation (stabilization of new patterns as part of self-regulation and identity). These stages define the direction of change and are not applied arbitrarily. At the same time, progression is not strictly linear and may involve partial overlap or temporary return to earlier modes of functioning.

Second, the process is organized across three regulatory levels: modulatory, analytical, and process-oriented, which define the depth and type of therapeutic work. The modulatory level involves regulation of states, activation of behavior, and restoration of basic cognitive accessibility. The analytical level focuses on motives, internal conflicts, meanings, and the differentiation between internal and external regulation. The process-oriented level involves higher-order capacities, including conscious agency, metacognitive awareness, and integration of experience into a coherent sense of self. These levels determine how the work is conducted at any given moment, depending on the individual's functional capacity.

Third, the model is integrative. It incorporates methods and techniques from different therapeutic traditions but organizes them within a unified structural system defined by stages, levels, and modules. Interventions are not applied as isolated techniques but as components of a coordinated process.

The practical implementation of rehabilitation is achieved through fifteen functional modules, which serve as the primary units of therapeutic work. Each module is defined by its clinical function, target processes, and expected outcomes, and is positioned within a specific level of regulation while contributing to stage-based progression.

Clinical work follows a structured sequence. First, the stressor ("problem zone") is identified. Second, maladaptive symptoms associated with this stressor are assessed. Third, coping patterns related to the stressor are evaluated. Fourth, therapeutic work is initiated through stage-based progression using modules selected across regulatory levels according to the individual's current functional state. Fifth, changes in coping organization are monitored as intermediate indicators of adaptation. Sixth, changes in symptom severity are evaluated as a consequence of changes in coping and functional

organization. Finally, later stages involve consolidation of adaptive patterns, including the development of stable skills and broader changes in values, beliefs, and goal orientation.

The modular structure allows the therapeutic process to be operationalized at the level of individual sessions. Each session can be described in terms of the relative engagement of specific modules, providing a basis for systematic process monitoring and analysis of how therapeutic mechanisms relate to changes in coping and symptom dynamics.

Across the course of rehabilitation, there is a general shift from externally supported regulation toward more autonomous and internally organized functioning. Successful rehabilitation is reflected not only in symptom reduction but in the restoration of adaptive functioning, increased flexibility of coping, and the development of stable, coherent forms of self-regulation. The transition from maladaptation to adaptation is therefore understood as a reorganization of psychological functioning across stages and levels rather than as a simple decrease in distress.

The following sections provide a detailed description of the functional modules, organized by regulatory levels.

The modulatory level represents the foundational layer of psychological regulation within the proposed model. It encompasses processes related to the regulation of physiological states, initiation and maintenance of action, and the stabilization of behavioral patterns in the context of stress. In conditions of psychological maladaptation, behavioral regulation is often disrupted. This may manifest as either hypoactivation (reduced initiative, passivity, withdrawal) or hyperactivation (restlessness, impulsive or chaotic activity), as well as instability in the ability to sustain goal-directed behavior. Such disruptions limit the individual’s capacity to participate effectively in higher-order cognitive and reflective processes, making behavioral-level work a necessary foundation for subsequent rehabilitation.

The modulatory level includes five functional modules: stabilization, activation, compensation, repetition, and automation. These modules are sequential, and reflect different aspects of behavioral regulation that may become relevant at different points

in the rehabilitation process. Their primary function is to restore a minimal level of functional engagement and to create conditions under which more complex forms of psychological work can be performed.

Stabilization is directed toward the reduction of acute physiological and emotional dysregulation and the restoration of a basic sense of safety and controllability. It is indicated in situations where heightened arousal, anxiety, or emotional overload interfere with the individual's ability to maintain attention, remain present in the interaction, or engage in structured activity.

The primary therapeutic task of stabilization is to establish a functional baseline state that allows for further psychological work. This involves reducing excessive activation of stress-response systems and supporting the re-establishment of regulatory balance between emotional and executive processes.

Typical interventions include grounding techniques, breathing exercises, orientation to the present moment, and the structuring of the therapeutic environment in a predictable and non-overstimulating way. The emphasis is placed on simplicity, and immediate accessibility of techniques.

The expected outcome of stabilization is the restoration of sufficient cognitive and emotional accessibility, reflected in the individual's ability to remain in contact, follow the structure of the session, and tolerate engagement with the topic without overwhelming distress. Stabilization is not an end point but a prerequisite for further work.

Activation is directed toward the gradual restoration of cognitive accessibility and reflective functioning after initial stabilization. Once acute emotional and physiological dysregulation has been reduced to a workable level, the next task is to re-engage the cognitive processes necessary for therapeutic work, particularly attention, working memory, inhibitory control, and the capacity for structured reflection. In this sense, activation is not primarily behavioral, but cognitive: it is aimed at making thinking available again.

The general goal of this module is to restore the functional engagement of executive and prefrontal processes that may remain underactive after stress has decreased. In

many cases, the individual is no longer acutely overwhelmed, yet still unable to think clearly, sustain focus, organize experience, or reflect in a structured way. Activation addresses this intermediate state by moving cognition from passive or slowed functioning toward active and usable engagement.

The primary technique of activation within this framework is guided cognitive stimulation through structured, basic forms of Socratic questioning. This approach is used to orient attention, support recall, and organize experience in a step-by-step manner. Questions are kept simple, concrete, and sequential, allowing the individual to engage with material without cognitive overload. The goal at this stage is not interpretation, but the restoration of accessible, organized thinking. In this form, activation serves as the transition from reduced stress toward functional reflection.

However, in some cases this pathway is not sufficient. Neuropsychological assessment and clinical observation may indicate that cognitive functioning, while not clinically impaired, is reduced in efficiency, speed, or accessibility. This may present as cognitive slowing, unstable attention, difficulty maintaining information, or rapid mental fatigue. Within this framework, such states are understood not as structural deficits, but as functional underactivation of cognitive systems.

In these situations, activation is supplemented by neurocognitive interventions based on a restorative approach. The aim is to reactivate cognitive functions that remain structurally preserved but functionally under-engaged. Neuropsychological assessment is used to identify relatively weaker and preserved functions, which then guide the selection of tasks.

Intervention is structured hierarchically. Work begins with tasks that are accessible for the individual and gradually increases in complexity. It typically progresses from basic processes such as sustained attention, simple selection, visual scanning, and short-term retention toward higher-order executive functions, including updating, inhibition, rule maintenance, and cognitive flexibility. Task complexity is increased step-by-step, ensuring that cognitive effort remains sufficient to stimulate activation without producing overload or disengagement. Where appropriate, this process may include elements of neurogymnastics involving combined motor–cognitive engagement.

The expected outcome of the activation module is improved cognitive accessibility, including enhanced attentional control, greater mental organization, increased capacity to sustain cognitive effort, and the emergence of a functional level of reflection. Activation therefore creates the necessary conditions for subsequent analytical and process-oriented work within the rehabilitation framework. Within this framework, cognitive dysfunction is not treated as an independent primary disorder, but as a functional factor influencing the accessibility and effectiveness of psychological rehabilitation.

Compensation addresses situations in which functional limitations persist despite partial stabilization and activation. Rather than attempting to eliminate these limitations directly, the module focuses on creating alternative strategies that allow the individual to maintain functional activity under constrained conditions.

The primary task of compensation is to support effective action despite reduced regulatory capacity. This may involve external structuring of behavior, simplification of tasks, and the use of supportive tools that reduce cognitive or emotional load.

Typical interventions include the use of plans, checklists, reminders, task decomposition, and environmental modifications that facilitate task completion. The emphasis is placed on practicality and immediate applicability in everyday contexts.

The expected outcome is the restoration of functional engagement through indirect means, reducing frustration and preventing secondary maladaptation associated with repeated failure. Compensation is conceptualized as a transitional mechanism that enables continued participation in life activities while deeper reorganization is taking place.

Repetition is directed toward the consolidation of newly acquired or reactivated behavioral patterns through structured practice. It is indicated when the individual has identified or initiated adaptive forms of action but lacks stability and consistency in their execution.

The core task of this module is to transform isolated actions into repeatable patterns. This involves reducing variability, increasing predictability, and strengthening the association between intention and behavior.

Interventions typically include repeated practice of specific behaviors, structured assignments, role-based simulations, and gradual exposure to situations that require the application of new skills. Feedback and iterative adjustment are essential components of this process.

The expected outcome is an increased capacity to perform adaptive behaviors with greater regularity and reduced internal resistance. Repetition supports the transition from effortful action to more stable patterns of functioning.

Automation represents the final stage of modulatory-level regulation, in which previously effortful behaviors become integrated into habitual patterns that require minimal conscious control. It is indicated when adaptive behaviors are consistently performed but still demand significant cognitive or emotional effort.

The primary task of automation is to reduce the cognitive load associated with everyday functioning by embedding adaptive behaviors into routine structures. This allows the individual to conserve resources and allocate attention to more complex or novel challenges.

Interventions focus on the establishment of routines, reduction of unnecessary decision-making, and reinforcement of consistent behavioral patterns across contexts. The goal is not rigidity but efficiency, enabling flexible functioning without excessive effort.

The expected outcome is the emergence of stable, low-effort behavioral patterns that support ongoing adaptation. Automation creates a foundation for sustained functioning and reduces vulnerability to relapse under stress.

The analytical level represents the organization of internal drives, values, conflicts, and sources of regulation that underlie behavior. While the modulatory level addresses the

capacity to act, the analytical level addresses the determinants of action, that is, why a person acts, avoids, hesitates, or becomes internally blocked.

In the context of maladaptation, dysfunction at this level is often expressed through internal conflict, rigid or externally imposed demands, avoidance driven by implicit fears, and instability in commitment to chosen actions. Individuals may appear behaviorally capable yet remain unable to act consistently due to unresolved motivational tensions or unclear internal positioning.

A key feature of this level is the distinction between external regulation (behavior guided by perceived expectations, obligations, or fears) and internal regulation (behavior aligned with personally integrated motives and values). Maladaptation frequently involves a dominance of externally driven or poorly differentiated motivational structures, leading to chronic tension and reduced coherence in action.

The analytical level includes five functional modules: validation, interpretation, separation, agency, and realization. These modules aim to reorganize motivational structures, reduce internal conflict, and support the emergence of more stable and internally grounded forms of regulation.

Validation is directed toward the recognition and acceptance of the individual's current internal state without immediate attempts to modify or reinterpret it. It is particularly important in situations where internal experience is dismissed, minimized, or replaced by rigid evaluative judgments.

The primary task of validation is to establish contact with genuine internal states and to legitimize them as psychologically meaningful. This includes emotions, thoughts, impulses, and subjective interpretations of the situation. Validation does not imply agreement with all interpretations but affirms the existence and relevance of the experience itself.

Interventions at this stage often draw from client-centered approaches [33], including reflective listening, accurate emotional labeling, and non-judgmental acknowledgment of the individual's experience. The therapist's role is to create a context in which the

individual can safely recognize and articulate internal states without defensive distortion.

The expected outcome is an increase in internal accessibility and a reduction of defensive avoidance. Validation creates the foundation for further work by allowing internal material to become available for reflection and differentiation.

Interpretation focuses on the clarification and structuring of internal experience, particularly in relation to underlying motives, beliefs, and implicit assumptions. It is indicated when internal states are present but remain poorly differentiated or cognitively unstructured.

The central task of this module is to transform raw or diffuse experience into a more organized and understandable form. This includes identifying patterns, linking emotions to specific situations or expectations, and making implicit motivational dynamics more explicit.

Interventions may include guided reflection, identification of cognitive and emotional patterns, clarification of meanings, and the use of structured dialogue to explore relationships between thoughts, feelings, and actions. Unlike purely cognitive restructuring, interpretation in this context is not limited to correcting distortions but aims at increasing clarity and coherence of internal processes.

The expected outcome is a more differentiated understanding of one’s own internal dynamics, allowing for greater predictability and reduced ambiguity in decision-making and behavior.

Separation addresses the differentiation between internal and external sources of regulation. It is particularly relevant in cases where behavior is driven by internalized demands, expectations, or evaluative standards that are experienced as obligatory but not fully owned.

The primary task of separation is to distinguish between what is internally generated (needs, values, preferences) and what is externally imposed or internalized from others (social expectations, authority figures, past relational dynamics). This process reduces fusion between the individual’s sense of self and external demands.

Within this framework, needs and values are used as practical tools for differentiation. Needs refer to internally experienced states of requirement (e.g., rest, safety, connection, autonomy) that signal conditions necessary for functioning, while values represent directions of behavior that the individual can recognize as their own. Values answer the question of how a person chooses to act and what kind of person they intend to be in the process of action [34]. Importantly, neither needs nor values are evaluated as correct or incorrect, but clarified in relation to actual experience and behavior.

Interventions may include the identification of "should"-statements, exploration of the origins of internal demands, and structured exercises aimed at distinguishing between different sources of regulation. This includes differentiation between "I need," "I want," and "I should," as well as identifying whether a perceived need reflects an internal state or an internalized expectation. In particular, value clarification is used to differentiate internally chosen orientations from introjected or externally imposed demands. Needs are explored in parallel as signals of internal regulation, rather than obligations or demands. This includes linking stated values to concrete behavior and examining whether they are experienced as chosen or as obligatory.

The focus at this stage is not on satisfying needs or modifying values, but on establishing differentiation between internal and external regulation.

The expected outcome is increased psychological differentiation and reduced internal conflict. By separating internal and external sources of regulation, the individual gains greater flexibility in responding to demands and can begin to reconsider previously unquestioned patterns.

Agency focuses on the development of an active and self-directed position in relation to one's own behavior and decisions. It is indicated when the individual demonstrates understanding of internal dynamics but remains passive, indecisive, or overly dependent on external guidance.

The central task of this module is to shift from a position of reaction to a position of intentional action. This involves taking ownership of decisions, recognizing the capacity to choose, and tolerating the responsibility associated with action. Importantly, action at this stage is not contingent on the complete absence of anxiety,

doubt, or other negative internal states. Rather, agency involves initiating behavior despite their presence, provided that these states have been sufficiently reduced and no longer fully inhibit functioning.

Interventions may include decision-making exercises, exploration of alternatives, clarification of priorities, and the explicit formulation of choices. A key component is the transition from verbal or cognitive positioning to concrete behavioral steps, even if minimal, allowing the individual to experience acting from an internally defined position. The therapist supports the individual in moving from analysis to commitment.

The expected outcome is the emergence of a more stable sense of authorship over one's actions. Agency is reflected not only in the ability to choose, but in the capacity to act on those choices in real situations, without reverting to avoidance or prolonged rumination. Agency is reflected in the ability to initiate behavior based on internally integrated motives rather than external pressure or avoidance.

Realization represents the consolidation of motivational structures through their implementation in real-world behavior. It is indicated when the individual has developed internal clarity and a sense of agency but has not yet consistently translated this into sustained action.

The primary task of realization is to align internal decisions with external behavior. This involves bridging the gap between intention and execution, ensuring that chosen directions are enacted in practice. Unlike agency, which may involve isolated acts of initiation, realization focuses on consolidation of consistent behavioral patterns.

Interventions may include goal setting, planning of concrete steps, monitoring of implementation, and reflection on discrepancies between intention and action. Particular emphasis is placed on repetition of actions across contexts, gradual increase in consistency, and the transformation of single acts into stable behavioral tendencies. The focus is on maintaining continuity between internal positioning and external behavior.

The expected outcome is increased consistency between what the individual identifies as important and what they actually do on every day basis. Realization reflects the

transition from occasional action to a more stable mode of functioning, where behavior becomes increasingly habitual and less dependent on momentary effort or situational factors. Realization strengthens the stability of motivational structures by embedding them in lived experience.

The process–oriented level represents the highest layer of psychological organization within the proposed model. It is concerned with the individual's capacity to function as a subject, that is, as an agent capable of awareness, reflection, integration of experience, and intentional engagement with reality.

While the modulatory level addresses the ability to act, and the analytical level addresses the determinants of action, the process–oriented level addresses the mode of experiencing and organizing reality itself. It includes metacognitive processes, self-awareness, integration of internal states, and the capacity to maintain coherence in complex or ambiguous situations.

Maladaptation at this level is not simply expressed through symptoms or internal conflict, but through disturbances in the structure of subjectivity. These may include fragmentation of experience, avoidance of direct awareness, overreliance on defensive narratives, or difficulties in maintaining a stable sense of self in relation to changing circumstances.

The process–oriented level includes five functional modules: confrontation, actualization, congruence, experimentation, and individuation. These modules are directed toward restoring contact with reality, integrating experience, and supporting the development of flexible and coherent agency.

Confrontation is directed toward establishing direct and undistorted contact with both internal experience and external reality. It becomes functionally relevant when the individual has already developed sufficient differentiation, agency, and experience of acting without reliance on dominant defensive patterns.

The primary task of confrontation is to interrupt the apparent balance maintained by avoidance, rationalization, or intellectualization, and to return the individual to the

factual structure of their situation. At this stage, the person is capable of remaining in contact with reality without immediate withdrawal or distortion.

Therapeutic interaction within this module is organized as a subject–subject dialogue, corresponding to an Adult–Adult position [35]. The therapist does not take a supportive or corrective role, and the individual is not positioned as dependent. Both participants operate within a shared field of reality, responsibility, and observable facts.

Functionally, confrontation focuses on identifying discrepancies between what the individual says, intends, or believes and what they actually do, avoid, or produce in reality. This includes direct comparison between verbalized positions and observable behavior, as well as clarification of responsibility for action, inaction, or delay.

An important mechanism of this process is the restoration of contact with one's own immediate emotional experience. Attending real, present emotions helps to bypass rationalization and other defensive distortions, allowing the individual to register what is actually occurring rather than what is explained or justified. Within this context, the therapist functions as another emotional participant in the interaction, providing a medium through which emotional reality can be recognized and maintained without being replaced by abstraction.

Interventions involve maintaining focus on the present situation, preventing shifts into abstraction, explicitly naming what is happening in terms of actions and consequences, and supporting contact with immediate experience. Confrontation does not aim to provoke emotional reactions such as guilt or shame, but to restore clarity of cause-and-effect relations.

The expected outcome is the ability to remain in contact with reality without defensive distortion and to recognize one's own role in the current situation. Confrontation reduces the influence of defensive balance and creates the conditions for further work.

Experimentation is directed toward testing new ways of thinking, feeling, and behaving in real-life conditions. It becomes relevant after congruence, when internal contradictions have been sufficiently reduced and the individual is able to act with greater internal consistency and stability.

The central task of this module is to move beyond already established patterns and to actively explore alternative ways of functioning. Unlike earlier stages, where action may be initiated despite uncertainty or internal resistance, experimentation involves a more structured and deliberate approach to action. The individual formulates possible ways of responding and tests them in real situations.

At this stage, behavior is no longer driven primarily by effort or necessity, but takes the form of an exploratory process. The individual begins to construct and carry out their own “experiments” in everyday life, using real situations as a field for testing new responses. These experiments are not performed as obligations or tasks imposed from outside, but as self-directed attempts to verify whether different ways of acting are possible and effective.

Interventions may include planning behavioral experiments, considering alternative scenarios, role exploration, and real-world trials. However, the emphasis gradually shifts away from therapist-guided activity toward independent action. The therapist’s role becomes less directive, while the individual increasingly relies on their own experience as the primary source of feedback.

A key feature of this module is the development of the capacity to act without guarantees of outcome. The individual learns to tolerate uncertainty, to observe the results of their actions, and to adjust behavior based on experience rather than expectation. This process expands the range of available responses and reduces dependence on previously fixed patterns.

The expected outcome is increased flexibility, self-reliance, and the ability to learn from one’s own actions. The individual develops a broader repertoire of behavior and a more confident capacity to engage with new or uncertain situations. Experimentation creates the conditions for the next stage, in which newly tested patterns can become stable and integrated into ongoing functioning.

Individuation is directed toward the formation of a stable and autonomous mode of functioning in which previously developed patterns of adaptation become part of the individual’s ongoing way of living. It is implemented at the stage of transformation and becomes relevant when new ways of thinking, acting, and relating have been

sufficiently tested and can be sustained without external support. The concept of individuation is grounded in the work of C. G. Jung [36], where it is understood as the process of developing a coherent and integrated personality. In the present model, this concept is applied in a functional and clinical sense.

The primary task of this module is not further change, but consolidation of a coherent and self-sustained subject position. This involves integrating experience, values, decisions, and behavior into a stable mode of functioning that can be maintained across different situations. In this sense, transformation is understood not as continuous change, but as the consolidation of a stable mode of self-regulation, in which behavior is guided by an internally consistent organization of experience [37]. The individual is no longer primarily solving a specific problem, but is able to live and act based on an internally consistent system.

At this stage, the person develops the capacity to remain themselves under varying conditions, without losing coherence or relying on external regulation. This includes the ability to tolerate uncertainty, face new challenges, and make decisions without returning to previously dominant maladaptive patterns. Internal consistency no longer requires constant effort or control, but becomes a more natural and stable state.

Interventions focus on integrating experience into a broader life context, recognizing continuity across different situations, and supporting the development of a stable internal reference for action. This may include reflection on personal history, consolidation of values, and recognition of one’s own way of responding to life situations. The therapist’s role becomes minimal, as the individual increasingly relies on their own experience as the primary guide.

A key feature of individuation is the transfer of acquired capacities to new domains. The individual is able to encounter new stressors without repeating the full therapeutic cycle, using previously developed mechanisms of adaptation in a flexible and independent manner.

The expected outcome is the formation of a stable and autonomous subjectivity, characterized by internal coherence, flexibility, and responsibility for one’s own

choices. Individuation does not imply the absence of difficulties or internal contradictions, but the ability to live with them without losing functional stability.

This module represents the completion of the transformation stage and the transition from structured therapeutic work to self-sustained adaptation. Psychological rehabilitation, in this sense, is not limited to symptom reduction, but results in a lasting capacity to function, choose, and develop under conditions of change and uncertainty.

1.7. Monitoring of Module Engagement, Changes in Coping, and Changes in Symptoms

A defining feature of the proposed framework is the inclusion of a monitoring system that allows the therapist to track the structure and dynamics of therapeutic work at the level of functional modules. While outcome measures such as symptom reduction provide information about effectiveness, they do not capture how change occurs. Monitoring module engagement addresses this limitation by introducing a structured way of describing the therapeutic process itself.

Within this model, each therapeutic session can be conceptualized as a configuration of module engagement. Rather than viewing sessions as homogeneous units, the approach assumes that different types of therapeutic work are performed within each session, corresponding to specific modules across modulatory, analytical, and process–oriented levels.

Module engagement is assessed using a brief session-based rating scale consisting of fifteen items, each corresponding to one of the functional modules. The purpose of this scale is to create a structured and consistent representation of the therapeutic process that can be analyzed over time.

Each module is rated on a four-point scale reflecting the degree of its presence in a given session:

0 - No engagement: the module is not present in the session

1 - Minimal engagement: the module is briefly or superficially present

2 - Moderate engagement: the module constitutes a meaningful part of the session

3 - High engagement: the module is central to the session and actively drives the process

This rating can be completed immediately after the session by the client and the therapist. In research contexts, independent raters may also be used to increase objectivity.

The use of a standardized module engagement scale allows for several important analytical possibilities. First, it enables the identification of dominant modules within individual sessions and across phases of therapy. This makes it possible to describe the structure of the rehabilitation process in a more precise and systematic way.

Second, the scale allows for the analysis of transitions between modules over time. Third, module engagement data can be aggregated across sessions to create an individual "process profile" of therapy. This profile reflects the relative contribution of different types of work and may vary significantly between individuals, even when the same general framework is applied.

An additional advantage of this approach is its compatibility with both clinical practice and research. In clinical settings, the scale supports therapist reflection and supervision by making implicit aspects of the process more explicit. In research contexts, it provides a structured dataset that can be used to explore process–outcome relationships.

Importantly, the scale is not intended to impose rigid structure on therapy or to constrain clinical flexibility. Rather, it serves as a descriptive tool that captures the natural variability of the process within a coherent framework. Therapists are not required to engage all modules in each session; instead, the scale reflects which modules are actually active.

Over time, repeated measurement of module engagement allows for the identification of patterns, such as overreliance on certain modules, underutilization of others, or difficulties in transitioning between levels of work. These patterns may inform

adjustments in therapeutic strategy and contribute to more targeted and effective intervention.

In sum, the monitoring of module engagement introduces a process-sensitive dimension to the proposed framework. It transforms the model from a purely conceptual system into an operational structure that can be observed, described, and analyzed in both clinical and research contexts.

Monitoring Changes in Coping (Brief COPE)

Within the proposed framework, coping is conceptualized as a dynamic system of responses through which the individual interacts with a stressor. Unlike symptom measures, which primarily reflect the outcome of maladaptation, coping patterns provide insight into the mechanisms that maintain or transform this state over time.

The Brief COPE inventory is used not only for baseline assessment but also for repeated measurement throughout the rehabilitation process. This allows for the analysis of how coping strategies evolve in response to therapeutic work and how these changes relate to shifts in module engagement and symptom dynamics.

A central assumption of the model is that maladaptation is associated not only with elevated distress but also with a restricted or dysregulated repertoire of coping strategies. This may manifest as overreliance on avoidance-based strategies (such as denial, disengagement, or self-distraction), excessive rumination, or inconsistent use of active coping mechanisms. In this sense, coping patterns reflect the organization of adaptation rather than merely the presence of effort to manage stress.

Repeated administration of Brief COPE makes it possible to track changes in the relative prominence of different coping strategies over time. These changes are not expected to follow a strictly linear trajectory but may reflect shifts corresponding to different phases of the rehabilitation process.

At earlier stages, changes in coping may be reflected in a reduction of chaotic or dysregulating patterns and the emergence of more basic forms of structured engagement. For example, individuals may move from passive disengagement toward minimal forms of active coping, even if these remain effortful and unstable.

As work progresses, coping changes may involve increased differentiation and intentionality. Individuals may begin to shift from externally driven or reactive strategies toward more internally grounded forms of coping, such as planning, problem-solving, or selective seeking of support. Importantly, this phase may also involve a temporary increase in awareness of internal conflict, which can be reflected in fluctuating coping patterns.

At the process–oriented level, coping is expected to become more flexible, context-sensitive, and integrated. Rather than relying on a fixed set of strategies, the individual develops the capacity to select and adapt coping responses based on situational demands and internal priorities. This shift reflects a transition from rigid or habitual coping toward adaptive self-regulation [38].

It is important to emphasize that the model does not assume a direct one-to-one correspondence between specific modules and specific coping strategies. Instead, module engagement is understood as influencing broader patterns of regulation, which are then expressed through changes in coping behavior. This avoids oversimplification and preserves the complexity of the therapeutic process.

From a methodological perspective, changes in Brief COPE scores can be analyzed in several ways. First, comparisons between baseline and post-intervention scores provide an overall measure of change in coping organization. Second, intermediate measurements allow for the examination of trajectories and transitional patterns. Third, correlations between module engagement and changes in coping may offer insights into process–mechanism relationships.

In clinical practice, monitoring coping changes can also inform therapeutic decision-making. For example, persistent reliance on avoidant coping strategies despite engagement in higher-level modules may indicate unresolved issues, suggesting the need to revisit earlier forms of work.

Overall, the inclusion of repeated coping assessment extends the framework beyond symptom reduction and provides a process-sensitive indicator of adaptive change. It allows for a more nuanced understanding of how individuals reorganize their

interaction with stressors and contributes to the empirical grounding of the proposed model.

Monitoring Changes in Symptoms (ADNM-20)

Within the proposed framework, the evaluation of rehabilitation outcomes is based on the systematic monitoring of changes in symptom severity and functional impairment. While module engagement reflects the structure of the therapeutic process and coping patterns reflect mechanisms of adaptation, symptom measures provide an index of the overall effectiveness of the intervention.

To capture this outcome dimension, the model incorporates two complementary instruments: the Adjustment Disorder–New Module questionnaire (ADNM-20) and the Work and Social Adjustment Scale (WSAS). Together, these measures allow for the assessment of both subjective maladaptation and its impact on everyday functioning.

The ADNM-20 is used as the primary measure of adjustment disorder symptoms. As described in earlier sections, it assesses core domains such as preoccupation with the stressor, avoidance, negative affect, and disturbances in functioning. Repeated administration of the ADNM-20 allows for the tracking of changes in maladaptive symptomatology over the course of rehabilitation.

Changes in ADNM-20 scores are interpreted as indicators of shifts in the individual's capacity to process and respond to the stressor. A reduction in scores suggests a decrease in maladaptive preoccupation, avoidance, and emotional distress, as well as improved ability to integrate the stressor into ongoing functioning. Importantly, such changes are understood not merely as symptom reduction, but as evidence of restored adaptive regulation.

However, symptom reduction alone does not fully capture the effectiveness of rehabilitation. Individuals may report decreased distress while still experiencing significant limitations in their ability to function in everyday life. For this reason, the framework includes the Work and Social Adjustment Scale (WSAS) as a measure of functional impairment.

The WSAS assesses the extent to which psychological difficulties interfere with key domains of daily functioning, including work, home management, social activities, private leisure, and close relationships. This provides a direct measure of the practical impact of maladaptation and its resolution.

Monitoring WSAS scores over time allows for the evaluation of whether improvements in symptomatology are accompanied by meaningful changes in real-world functioning. In the context of the present model, restoration of functioning is considered a central criterion of successful adaptation, often taking precedence over subjective symptom relief alone.

The combined use of ADNM-20 and WSAS creates a dual-outcome system that captures both internal and external dimensions of change. This is consistent with the conceptualization of adjustment disorders as conditions involving both subjective distress and impaired adaptation.

From a process–outcome perspective, changes in these measures can be analyzed in relation to both module engagement and coping dynamics. For example, it becomes possible to examine whether increased engagement in certain modules is associated with subsequent reductions in ADNM-20 scores, or whether improvements in coping flexibility correspond to gains in WSAS-measured functioning.

Importantly, the model does not assume a simple linear relationship between process and outcome variables. Changes in symptoms and functioning may occur at different rates and may not always be synchronized. For instance, individuals may initially experience increased distress as awareness and confrontation of internal states deepen, even while functional engagement begins to improve [39].

Repeated measurement at multiple time points (baseline, intermediate stages, and post-intervention) allows for the identification of trajectories of change rather than relying solely on pre–post comparisons. This provides a more nuanced understanding of the rehabilitation process and supports the analysis of both short-term fluctuations and long-term outcomes.

In summary, the inclusion of ADNM-20 and WSAS as outcome measures completes the assessment system of the proposed framework. Together with module engagement and coping assessment, they form a multi-dimensional structure that allows for the comprehensive evaluation of both the process and results of psychological rehabilitation in adjustment disorders.

1.8. Training and Skill Acquisition

A central assumption of the proposed framework is that psychological rehabilitation is not limited to symptom reduction or insight generation, but involves the acquisition, consolidation, and integration of adaptive skills across multiple levels of functioning. From this perspective, therapeutic change is understood as the development of new regulatory capacities that can be applied independently beyond the therapeutic context.

Within the model, each functional module can be conceptualized not only as a unit of therapeutic work but also as a unit of skill acquisition. This dual nature allows the framework to be used not only for intervention but also for structured training of both clients and specialists.

At the modulatory level, skill acquisition is primarily oriented toward the development of basic regulatory capacities. These include the ability to stabilize physiological and emotional states, initiate and sustain activity, structure behavior under conditions of stress, and establish repeatable and automated patterns of functioning. Skills at this level are typically trained through repetition, structured exercises, and gradual increase in complexity, with an emphasis on accessibility and practical applicability.

At the analytical level, skill acquisition involves the development of capacities related to the recognition, differentiation, and regulation of internal motivational processes. This includes the ability to identify and validate internal states, understand the origins and structure of one’s motives, distinguish between internal and external sources of regulation, and make intentional decisions based on integrated values. Training at this level often involves guided reflection, structured dialogue, and exercises aimed at increasing clarity and internal differentiation.

At the process–oriented level, skill acquisition focuses on higher-order capacities such as sustained awareness, integration of experience, flexibility of perspective, and the ability to function as an intentional agent. These skills are less procedural and more process-oriented, requiring the development of stable attention to experience, tolerance of ambiguity, and the capacity to maintain coherence across changing contexts. Training at this level often involves experiential exercises, reflective practices, and real-world application of newly developed modes of functioning.

An important characteristic of the model is that skill acquisition is progressive and interdependent across levels. Basic regulatory skills create the conditions necessary for effective work at higher levels, while higher-level integration supports the stability and flexibility of behavioral patterns. As a result, training is not organized as isolated skill sets but as a coordinated system of development.

From a methodological perspective, the modular structure of the framework allows for the design of structured training programs. Each module can be operationalized in terms of specific learning objectives, exercises, and observable indicators of skill acquisition. This makes it possible to create standardized training protocols for both clinical practice and educational contexts.

For clients, this approach supports the gradual internalization of regulatory strategies and the transition from therapist-guided work to independent functioning. Skills are not only practiced within sessions but are transferred to real-life situations, where they are reinforced through repetition and contextual application.

For specialists, the framework provides a clear structure for developing clinical competence. Training can be organized around the mastery of individual modules, the ability to recognize appropriate indications for their use, and the capacity to flexibly combine modules across different regulatory levels. This creates a bridge between theoretical knowledge and practical implementation.

Another important implication of the model is the possibility of monitoring skill acquisition through the same system used for process monitoring. Patterns of module engagement over time may reflect not only therapeutic activity but also the gradual

development of client competencies. This creates an integrated system in which intervention, training, and assessment are closely interconnected.

Finally, the emphasis on skill acquisition positions the model within a broader perspective of rehabilitation as the restoration and development of functional capacity. Rather than focusing solely on the resolution of symptoms, the framework supports the emergence of sustainable adaptive functioning, enabling individuals to navigate future stressors with increased flexibility and resilience.

1.9. Clinical and Methodological Implications

The proposed stage-based integrative framework has several important implications for clinical practice, professional training, and research methodology in the field of psychological rehabilitation. By combining a structured process model with multi-level assessment and modular intervention, it offers a coherent system that addresses limitations of both purely symptom-oriented and loosely integrative approaches.

From a clinical perspective, the model provides a structured yet flexible framework for organizing therapeutic work in adjustment disorders. One of its primary advantages lies in the ability to differentiate between levels of dysfunction and to tailor interventions accordingly. This differentiation is particularly relevant in complex presentations, where symptoms may appear similar across individuals, but the underlying mechanisms differ substantially. For example, behavioral passivity may result from physiological dysregulation, unresolved motivational conflict, or fragmentation at the level of subjectivity. The model supports a more precise formulation of such cases and reduces the risk of mismatched interventions.

Another important clinical implication is the integration of assessment and intervention into a continuous process. The use of baseline measures (ADNM-20, Brief COPE, WSAS), combined with ongoing monitoring of module engagement and repeated outcome assessment, creates a feedback-informed system. This allows the clinician to adjust the course of therapy based on observable process and outcome indicators, rather than relying solely on subjective judgment or fixed treatment plans.

The framework also emphasizes the importance of stressor-specific work. By organizing rehabilitation around distinct stressors, the model increases ecological validity and allows for more targeted intervention. This approach is particularly useful in contexts where individuals face multiple concurrent stressors, as it enables the separation and systematic processing of different domains of maladaptation.

From a methodological perspective, the model introduces a structured way of studying the relationship between therapeutic processes and outcomes. The inclusion of a module engagement scale provides a means of operationalizing the therapeutic process, which is often difficult to capture in empirical research. This creates the possibility of analyzing process–outcome relationships, such as the association between specific patterns of module engagement and changes in coping or symptomatology.

Importantly, the framework avoids oversimplified assumptions about direct causality between individual interventions and outcomes. Instead, it supports the investigation of complex, multi-level interactions between process variables (module engagement), mechanism variables (coping patterns), and outcome variables (symptoms and functioning). This aligns with contemporary perspectives in psychotherapy research that emphasize dynamic systems and non-linear change [40].

The model also has implications for the standardization of clinical protocols. By defining modules in terms of their functions, indications, and expected outcomes, it becomes possible to create structured intervention guidelines that retain flexibility while ensuring conceptual coherence. This may facilitate the development of training programs, supervision frameworks, and quality control procedures in clinical settings.

In the context of professional education, the framework provides a clear structure for developing clinical competencies. Training can be organized around the mastery of modules and the ability to operate across different regulatory levels. This supports a transition from technique-based learning to process-oriented competence, where the clinician understands not only what to do, but why and when to apply specific interventions.

Another important implication is the compatibility of the model with digital and computational approaches. The structured nature of modules, combined with session-

based monitoring, creates a foundation for the development of automated or semi-automated systems for session analysis, decision support, and supervision. Such systems may assist clinicians in identifying patterns in therapeutic work, tracking progress, and generating structured summaries of sessions.

At the same time, it is important to acknowledge the limitations of the framework. The model requires further empirical validation, particularly in terms of the reliability of module engagement ratings and the strength of associations between process, coping, and outcome variables. Additionally, the application of the model in different clinical populations and cultural contexts remains an area for future investigation.

Finally, the proposed framework contributes to a broader conceptual shift in psychological rehabilitation, from a focus on symptom reduction to an emphasis on restoring adaptive functioning and agency. By integrating assessment, intervention, monitoring, and training within a single structure, the model offers a comprehensive approach that is both clinically applicable and methodologically grounded.

1.10. Conclusions

This chapter has presented a stage-based integrative framework for the assessment and psychological rehabilitation of individuals with adjustment disorders, combining a structured process model with multi-stage and multi-level analysis of psychological functioning. The proposed approach conceptualizes maladaptation not merely as a set of symptoms, but as a disruption in the organization of adaptive regulation across five stages of the rehabilitation process (Discourse, Reflection, Integration, Formation, and Transformation) and three regulatory levels (modulatory, analytical, and process-oriented). Together, these dimensions form a system of fifteen functional modules, defined as specific processual units of intervention with their own clinical functions, objectives, techniques, and expected outcomes.

A central contribution of the framework lies in its integration of assessment, intervention, and monitoring into a unified system. Baseline evaluation using ADNM-20, Brief COPE, and WSAS allows for a multi-dimensional understanding of the individual’s condition, encompassing symptom severity, coping organization, and functional impairment.

The introduction of session-based monitoring of module engagement provides a novel process-oriented dimension, enabling the systematic description of therapeutic activity and its evolution over time. When combined with repeated assessment of coping and symptom dynamics, this creates a comprehensive structure for analyzing the relationships between process, mechanisms, and outcomes.

The framework emphasizes that effective rehabilitation involves more than symptom reduction. It requires the restoration of adaptive functioning, the reorganization of motivational structures, and the development of subject-level capacities such as awareness, coherence, and agency. From this perspective, psychological change is understood as a multi-level and dynamic process rather than a linear sequence of interventions.

Another key aspect of the model is its applicability to both clinical practice and professional training. By defining modules as units of both intervention and skill acquisition, the framework supports the development of structured training programs for specialists and facilitates the transfer of therapeutic gains into independent functioning for clients.

At the same time, the model provides a methodological basis for future empirical research. The operationalization of therapeutic processes through module engagement, combined with standardized measures of coping and outcomes, opens the possibility of investigating process–outcome relationships in a systematic and replicable manner.

In summary, the proposed framework offers a coherent and flexible system for understanding and organizing psychological rehabilitation in adjustment disorders. By integrating multiple levels of analysis and emphasizing both process and outcome, it contributes to the development of more structured, transparent, and effective approaches to clinical practice.

All conceptual, theoretical, and methodological components of the proposed framework were developed by the author. Artificial intelligence tools were used exclusively for language editing, translation, and stylistic refinement of the text.

Section 2

Savenkova Iryna, Malyhina Viktoriia

THE MULTIMODAL NATURE OF EMOTIONAL EXPERIENCES: FROM PSYCHOSOMATIC FIXATION TO THE NEUROPLASTIC RECONSTRUCTION OF EXPERIENCE

2.1. INTRODUCTION

Fundamental research in the emotional domain has made a significant contribution to our understanding of the adaptive mechanisms of the human psyche. W. James's classical peripheral theories outlined early approaches to studying the physiological components of emotional experience. Subsequently, P. Ekman's theories of basic emotions reinforced this direction with substantial empirical data. Within the classical paradigm, emotions were often described as discrete and largely biologically determined reactions. Many models posited that emotions arise automatically in response to external stimuli and serve adaptive functions.

At the same time, the emphasis on biological determinism contributed to a conceptual separation of the human cognitive and emotional spheres. Early cognitive approaches frequently viewed intense affect as an evolutionarily older component that could complicate rational thought. Consequently, psychological interventions often focused on the cognitive control of emotions or the pharmacological reduction of somatic symptoms.

The current stage of societal development is characterized by high levels of prolonged traumatization and chronic stress. Clinical observations indicate that under such conditions, classical linear models exhibit significant limitations. Complex states are difficult to process effectively by targeting only a single plane of experience. This has prompted a paradigmatic shift towards understanding the systemic nature of the psyche.

Contemporary affective neuroscience has substantially broadened the understanding of these phenomena. L. F. Barrett's theory of constructed emotion (Barrett, 2017) and the concept of active interoceptive inference (Seth & Friston, 2016) demonstrate that emotional experience is a dynamic constructing reality. Emotional meaning updates most effectively when it is engaged across the cognitive (prediction), affective (valence), and somatic (autonomic regulation) levels. This unity forms a complex multimodal architecture of experience.

States involving the disruption of the natural cycle of self-regulation require special attention. Under conditions of extreme stressors, the suppression or dissociation of the emotional response frequently occurs (Van der Kolk, 2014). Blocked experience becomes fixated systemically: rigid predictive models form at the cognitive level (Friston, 2010), limbic system hyperreactivity develops at the affective level (Cozolino, 2017), and autonomic dysregulation emerges at the somatic level. This results in the rapid accumulation of allostatic load, which is a predictor of the development of psychosomatic disorders (Bobba-Alves, Juster, & Picard, 2022; Ellis et al., 2019).

The high relapse rate following the use of exclusively rational-cognitive protocols indicates the limitations of monomodal interventions. This fact necessitates a transition to polymodal approaches in therapy. As S. G. Hofmann and S. C. Hayes (2024) note, the effectiveness of modern intervention depends on targeting universal processes of change at the intersection of all biopsychosocial levels.

The key to such transformation lies in the constructive nature of memory. The discovery of the memory reconsolidation phenomenon (Ecker, Ticic, & Hulley, 2012; Nader & Hardt, 2009) proves the possibility of updating even persistent traumatic memories. The catalyst for this process is the activation of new affective and somatic experiences in a safe environment (Lane, 2020; Stein, Rohde, & Henke, 2015).

The relevance of this study is driven by the need for a theoretical rationale of the polymodal approach as an optimal tool for encompassing all components of experience. The organic integration of cognitive reappraisal, affective discharge, and

somatic regulation creates the most favorable conditions for breaking the cycle of psychosomatic fixation.

The object of the study is the emotional experiences of the individual within the system of their mental health.

The subject of the study is the multimodal nature of emotional experiences and its significance for the processes of neuroplastic reconstruction of experience.

The goal of the study is to provide a theoretical analysis of the multimodal nature of emotions and to determine the conditions under which polymodal integration promotes neuroplasticity.

The research hypothesis is based on the assumption that emotional experience possesses a complex multimodal structure and its own temporal dynamics. We hypothesize that a holistic engagement of cognitive, affective, and somatic components within a polymodal approach creates the necessary foundation for the processes of neuroplastic reconstruction of experience.

Research Framework. The theoretical and methodological basis of this work is the integration of leading scientific concepts: the theory of constructed emotion (Barrett, 2017), active interoceptive inference (Seth & Friston, 2016), reconstructive memory (Nader & Hardt, 2009), and polyvagal regulation (Porges, 2011; Doidge, 2007; Maksymenko & Kuzminskyi, 2022). Within this framework, emotion is viewed as a dynamic systemic construct across cognitive, affective, and somatic levels. Consequently, the transformation of destructive states is interpreted as a holistic restructuring of experience grounded in the mechanisms of neuroplasticity.

2.2. The interdependence of cognitive and affective processes in memory reconstruction

For a long time, classical psychology was dominated by the metaphor of memory as an "archive" or a "library," where each memory is stored as a static, immutable trace of an event. It was believed that remembering consists of the simple retrieval of this information from storage. However, modern cognitive neuroscience has fundamentally

revised this notion. Today, memory is interpreted as dynamic, active reconstruction occurring every time one accesses past experience.

A fundamental contribution to this paradigm shift was made by the research of Daniel Schacter. He substantiated the concept of constructive memory, according to which our ability to remember the past is closely linked to our ability to imagine the future (Schacter & Addis, 2007). The brain does not merely record facts; it stores fragments of experience to flexibly combine them later for building simulations of future events. Thus, memory emerges not as a tool for recording the past, but as an adaptive mechanism for prediction.

This constructive nature of memory makes it extremely vulnerable to the influence of current emotional states. Assembling a memory from individual fragments occurs each time under the influence of the immediate affective context. It is emotions that act as a filter, determining which details of experience will be retrieved and which will be ignored or altered. Within the multimodal architecture of emotions, the cognitive and affective systems operate in inseparable unity: affect sets the "color" and "valence" of the reconstruction, while cognitive structures provide it with a narrative form.

A problem arises when the natural cycle of this interaction is disrupted. In situations of extreme stress or trauma, a phenomenon of affective inertia occurs, in which the system becomes looped within a specific emotional modality. In the context of the incomplete emotional wave model (Malyhina & Savenkova, 2026), this means that blocked affect becomes a dominant predictor. Instead of flexible reconstruction, memory begins to produce rigid, distorted simulations where past threat is constantly projected onto the future. This creates a closed loop of psychosomatic fixation, where changing a stable affective pattern becomes impossible without integrating the somatic dimension of experience.

Of particular significance in this process is the mechanism of predictive coding, which views the brain as an active system for generating hypotheses. Within this model, memory serves not as a report on the past, but as a generative model for minimizing prediction error in the present (Friston, 2010). If an emotional wave remains incomplete, it creates a persistent bias in the hierarchy of predictions. The system

begins to assign excessive weight to threat signals, leading to the somatization of affect. Thus, the neuroplastic reconstruction of memory requires not just a mechanical update of information, but an active restructuring of predictive models through the engagement of new somatic markers of safety.

Remembering is a nonlinear cognitive operation that integratively assembles fragmented elements of experience. Instead of accessing a stable representative construct, the cognitive system generates a new memory configuration each time. This generation is directly determined by the subject's current perceptual hypotheses, their existing semantic networks, and the context of the present situation. When an individual accesses their past, the psyche performs a recoding of events, subordinating them to the requirements of the present time. As noted by the prominent memory researcher Elizabeth Loftus, in the reproduction, memory becomes extremely vulnerable to interference under the influence of the current context, leading stimuli, and the individual's active cognitive schemas (Loftus, 2005). A memory assimilates new beliefs and, most importantly, new emotional states in which the person finds themselves at the moment of remembering.

It is through these continuous acts of reconstruction that the individual’s subjective world picture is formed. This picture is not an objective reflection of reality; it is a complex conceptual tapestry woven from individual meanings. Ukrainian researcher Maksym Smulson emphasizes that the cognitive processes of experience reconstruction are key to understanding how an individual adapts to a changing environment (Smulson, 2020). Martin Conway, in his model of autobiographical memory, demonstrates that the subjective world picture is inextricably linked to the self-concept system (Conway & Pleydell-Pearce, 2000). Our memory primarily preserves and reconstructs information that aligns with our current goals, beliefs, and emotional needs, while filtering out or modifying dissonant information. Consequently, the perception of the past, present, and future merges into a single, constantly updated construct.

These fundamental concepts are of critical importance for substantiating the polymodal approach in psychological practice. If memory is constructive, then we possess a

theoretical foundation for the claim that destructive internal states or traumatic experiences should not, in many cases, be viewed as immutable givens. Since a memory is reassembled anew each time, a potential opportunity arises to influence this assembly process. If new modalities are engaged at the moment of reconstruction (for example, a conscious bodily response or a different affective charge), it becomes possible to achieve a qualitatively different result. Thus, research into the constructive nature of memory yields a vital methodological conclusion: if experience is constructed, it can be reconstructed more adaptively.

The awareness of the constructive nature of memory inevitably leads to the question of which factors determine the direction and content of this incessant reconstruction. As noted by researchers in affective neuroscience (Lane et al., 2015; Stein, Rohde, & Henke, 2015), the emotional context plays a decisive role in the processes of memory recoding and updating. An individual's subjective world picture is formed not through the dispassionate intellectual recording of facts, but through their affective valence. For a deep understanding of this mechanism, the concept of structural differentiation between the processes of experiencing and remembering, developed by Daniel Kahneman, is critically important (Kahneman, 2011).

In his research, Kahneman substantiated the existence of two relatively autonomous instances of the human cognitive system: the "experiencing self" and the "remembering self." According to this paradigm, the experiencing self functions exclusively in the present moment. Its task is the continuous recording of the flow of external sensory and internal interoceptive information. In contrast, the remembering self operates according to fundamentally different, non-linear laws. Its primary goal is the formation of a coherent life narrative and the generation of predictions for future adaptation based on past experience. Kahneman convincingly proved that in the converting direct experience into long-term memory, the cognitive system almost entirely ignores the objective chronological duration of an event (duration neglect). Instead of an objective calculation of time, the psyche relies on the peak-end rule heuristic. According to this regularity, the subjective evaluation of past experience is encoded in memory primarily based on two key variables: the moment of highest emotional intensity (the affective peak) and the emotional coloring of the event's conclusion (Kahneman, 2011). As later

studies add, it is the moments with high self-reference at the peak of an experience that dominate global retrospective evaluations (Fredrickson, 2000).

A fundamental explanation for why the peak and the end possess such definitive power is provided by contemporary affective chronometry — a field that studies the temporal dynamics of emotional reactions (Davidson, 2015). Emotional experience is a dynamic sequence of reactivity, peak, and recovery. Neurobiological studies (McGaugh, 2015) indicate that at the moment of highest emotional arousal (the peak), there is a powerful release of neurohormones that critically enhance memory consolidation in the hippocampus. Furthermore, the extreme arousal during such peak episodes determines the effect of prospective assimilation: the psyche continues to encode stimuli and events that arrive even after the critical situation itself has ended through the prism of the experienced affect, merging them into a single, persistent traumatic construct (Clewett & McClay, 2024).

These temporal parameters are particularly important in the analysis of maladaptive and traumatic states. According to the dynamic-phase model of emotion processing (Panayiotou, Panteli, & Vlemincx, 2019), a healthy emotional cycle entails an obligatory transition from reaction to recovery and habituation. However, when this natural process is interrupted or the recovery phase is unjustifiably prolonged, a persistent allostatic load is formed. It has been empirically proven that individuals with a prolonged recovery time from negative affect (emotional inertia) are prone to higher levels of depressive symptoms and psychological stagnation (Yang et al., 2018). In the context of Kahneman's heuristic, this has a direct practical implication: if the emotional dynamics have not passed through the phase of natural recovery (i.e., have not concluded adaptively), their "end" permanently remains negative, which rigidly determines a maladaptive evaluation of the entire lived experience.

Understanding this chronometry and the affective peak heuristic allows for the scientific rationale of the limitations of purely cognitive (rational) interventions in psychotherapy. Altering the subjective world picture is impossible by appealing exclusively to objective logic or the duration of events, since the representation of traumatic experience relies on a fixed emotional peak and an unresolved end.

According to research in the neurobiology of transformation (Ecker, Ticic, & Hulley, 2012; Lane et al., 2015), the structural alteration (updating) of such a memory requires the opening of a "reconsolidation window." According to Bruce Ecker's clinical model (Ecker, Ticic, & Hulley, 2012), this process is triggered by the occurrence of a so-called "prediction error"—a situation where an activated old experience encounters a new one that radically contradicts it. For this update to result in neuroplastic changes, the new experience must necessarily be accompanied by corresponding emotional arousal and bodily engagement. In this case, the psychological system receives an alternative affective extremum and the opportunity for an ecological and safe completion of the experience. It is precisely this multimodal synthesis that creates the necessary prerequisites for rewriting the traumatic narrative.

Elucidating the temporal and structural regularities of experience fixation logically directs the research focus toward the nature of the very material being fixated. In classical psychology and early neurobiology, an essentialist view of emotions long prevailed, treating them as innate, biologically determined reactions or basic affective programs localized in specific brain regions and automatically activated in response to external triggers. However, for understanding the deep mechanisms of psychosomatic fixation and neuroplasticity, such a reductionist model proved insufficient. A genuine paradigmatic shift in this field occurred thanks to the Theory of Constructed Emotion, developed by Lisa Feldman Barrett (Barrett, 2017).

According to L. F. Barrett's concept, emotions are not isolated entities that the brain passively identifies or mechanistically generates. On the contrary, every emotion is a complex conceptual construct created by the cognitive system in real time. This construct is the result of the continuous merging of several fundamental modalities: current interoceptive (bodily) sensations, exteroceptive information from the external environment, and the individual's past experience. That is, the brain utilizes its available conceptual categories (cognitive level) to assign subjective meaning to changes in the autonomic nervous system (somatic level). An emotion arises precisely at the moment of this categorization.

Construction is deeply rooted in the neurobiological paradigm of predictive processing, which is actively developed by Karl Friston (Friston, 2010). According to his views, the human brain functions not as a reactive machine waiting for stimuli, but as a proactive predictive system. Deprived of direct access to the external world and internal organs, the brain is forced to constantly generate anticipatory hypotheses regarding the causes of sensory and bodily signals. In the context of the affective sphere, this concept, adapted by Anil Seth and Karl Friston, received the name of active interoceptive inference (Seth & Friston, 2016). According to this model, when the body's internal environment changes—for example, the heart rate accelerates or muscle tone alters within the framework of allostatic regulation—the brain attempts to predict the cause of these changes based on past experience. If the system identifies the context as a threat, the autonomic arousal is conceptualized specifically as fear or anxiety (Barrett, 2017; Seth & Friston, 2016). Consequently, the demarcation into separate cognitive and affective processes is artificial: it is a single, complex dynamic network where meaning-making and bodily activation are inextricably merged into a unified construct.

This understanding of the integrative nature of emotions is also corroborated in Ukrainian psychological science. In particular, while researching cognitive psychology and the processes of experience reconstruction, Maksym Smulson emphasizes the inextricable link between meaning-making and adaptation. In this context, the reconstruction of experience emerges not as a purely rational operation, but as a profound restructuring the subjective world picture, where a change in cognitive representations inevitably requires a revision of the corresponding affective and sensory patterns (Smulson, 2020). The created emotional construct becomes part of the self-concept and dictates the algorithms for subsequent perception of reality.

The significance of the theories of constructed emotion and predictive coding for substantiating polymodal psychological practice is fundamental. Relying on these concepts, one can make the theoretical assumption that a destructive state emerges as a fixated maladaptive prediction—a kind of erroneous forecast by the cognitive system, which, by inertia, anticipates danger and generates a corresponding bodily response. Since an emotion is the result of the merging of cognitive categorization and bodily

interoception, attempts to alter this state through only one modality (for example, purely through rational discussion of the problem) often demonstrate reduced effectiveness. The cognitive system is unlikely to deeply update its predictions if the body continues to signal a threat. Given this, a qualitative transformation of experience requires complex intervention at all levels of emotion construction: the practitioner helps the client alter the bodily state (somatic regulation), provide the experience with a new, safe valence (affective discharge), and create a different conceptual category for it (cognitive reframing). Such a merging of modalities in the therapeutic process mirrors the natural mechanism of emotion construction, creating the most favorable and ecological prerequisites for qualitatively rewriting the fixated experience.

Understanding that emotion is a multidimensional construct, and memory is its continuous reassembly, leads to a key methodological question: under what conditions is the purposeful alteration of a maladaptive emotional trace possible? The answer to this is provided by fundamental discoveries in the field of neuroplasticity, particularly the phenomenon of memory reconsolidation. For a long time, the dogma prevailed in neurobiology that a consolidated memory is immutable. However, the research of Karim Nader and Oliver Hardt (Nader & Hardt, 2009) proved the existence of another mechanism: when a previously stored, emotionally significant memory is activated, its neural ensemble is unlocked and temporarily enters a labile (plastic) state.

This brief period of neurobiological lability opens a unique opportunity for deep structural alteration of the very core of the memory. As Bruce Ecker and co-authors note (Ecker, Ticic, & Hulley, 2012), for an old traumatic pattern to be adaptively rewritten, a direct collision of the maladaptive expectation with a new, distinctly different experience is necessary (the emergence of the aforementioned cognitive-affective dissonance).

However, a purely intellectual awareness of this discrepancy proves insufficient. Drawing on research into the neurobiological mechanisms of psychotherapy (Lane et al., 2015) and the work of Melanie Stein (Stein, Rohde, & Henke, 2015), the theoretical assumption can be made that a new emotional and bodily experience acts not merely as an external tool of influence, but as a natural catalyst that the system actively

requires for memory updating. This perspective allows us to view the phenomenon of psychological stagnation from a different angle: the constant reproduction of an unlived emotional charge can be seen as an unconscious attempt by the psyche to find this necessary new experience in order to finally complete the interrupted cycle. For the old representation to be adaptively altered, this discovered corrective experience must be accompanied by appropriate affective arousal capable of competing with the initial emotional charge of the event.

This neurobiological foundation theoretically substantiates the necessity of a polymodal approach. The activation of an old cognitive narrative while simultaneously generating a new, safe bodily response and an alternative affective valence allows the psychological system to finally integrate this experience, qualitatively altering its destructive charge.

Thus, the analysis of the interaction of cognitive and affective processes proves that memory is a plastic tool of adaptation, the functioning of which critically depends on the affective background. Psychosomatic fixation during an incomplete emotional wave is a consequence of the disruption of this plasticity through the mechanism of affective inertia. This confirms the necessity of engaging the somatic component to unblock the natural cycle of experience reconstruction, which will be examined in detail in the following section.

Summarizing the theoretical provisions regarding the cognitive-affective architecture of experience, it can be argued that memory and emotional experiences function not as static archives of the past, but as dynamic, interdependent processes of the continuous construction of subjective reality. These processes are governed by the fundamental regularities of predictive processing and affective chronometry. The organism does not simply reproduce stored information; instead, it reconstructs it each time based on the current context, generating probabilistic hypotheses regarding future events and forming a corresponding system of expectations.

In this context, the fixation of traumatic or maladaptive experience is viewed primarily as a consequence of the interruption of the natural chronological cycle of the emotional reaction. According to the conceptual model of the incomplete emotional wave

(Malyhina & Savenkova, 2026), we assume that the blockage of affective dynamics is capable of causing a systemic stagnation of the individual's functioning simultaneously at the cognitive, affective, and somatic levels. This leads to the formation of a rigid internal narrative and a maladaptive mnemonic architecture, in which the system constantly generates erroneous predictions regarding the presence of a threat in an objectively safe present time.

At the same time, contemporary neurobiological insights into the constructed nature of emotions and the mechanisms of synaptic memory reconsolidation form a scientifically substantiated foundation for the possibility of a reverse transformation of such fixated states. Constructing emotional valence is inextricably linked to the perception of interoceptive bodily signals, overcoming a stable affective pattern cannot be achieved exclusively through cognitive reappraisal. Attaining a structural update of the emotional memory trace within the reconsolidation window inevitably requires a deep integration of the somatic dimension and the consideration of physiological markers of safety.

Understanding exactly how the disruption of the natural temporal dynamics of affect materializes at the level of visceral physiology requires further detailed study. The processes of cumulative systemic allostatic load and the subsequent formation of clinical psychosomatic symptoms due to emotional inertia constitute an extremely complex phenomenon. A thorough analysis of the mechanisms of such somatization and the role of autonomic dysregulation in maintaining the incomplete emotional wave is the subject of the next section of our work.

2.3. The somatic dimension: psychosomatic manifestations of unprocessed emotions

The analysis of the constructed nature of emotions and the mechanisms of memory reconsolidation inevitably necessitates a turn toward their physical substrate. Historically, within classical cognitive paradigms such as R. Atkinson and R. Shiffrin’s information processing model or R. Lazarus’s cognitive-mediational theory of stress (Lazarus, 1966), emotional experience was viewed primarily as the result of mental

appraisal, where bodily reactions served merely as a concomitant physiological background. This focus on the "disembodied" architecture of the mind allowed for a detailed description of the logic of thought, yet it left beyond scientific consideration the mechanisms of how exactly emotional experience is incorporated into physiology and becomes a somatic symptom.

The contemporary shift toward "embodied cognition" became possible through the deconstruction of Cartesian dualism in psychology and neuroscience. A significant milestone here was Antonio Damasio's somatic marker hypothesis (Damasio, 1994), which demonstrated that the brain's rational activity is inextricably linked to the body's autonomic signals. Although Lisa Feldman Barrett's recent theory of constructed emotion (Barrett, 2017) offers a more radical view, asserting that emotion arises only at the moment of cognitive categorization of interoceptive signals, both approaches agree on the essential point: emotion cannot be separated from its bodily embodiment. Emotional experience is not a static act but a highly dynamic biological process unfolding in the time and space of the body.

Within the framework of affective chronometry, this process is viewed as a wave-like structure with its own onset phase, affective peak, and recovery period (Davidson, 2015). However, when this natural cycle is interrupted due to the intensity of stress or the operation of psychological defenses, a state of psychosomatic fixation emerges. A bodily reaction that has not found emotional and cognitive completion transforms into static tension. Drawing on the dynamic-phase model of emotion processing (Panayiotou, Panteli, & Vlemincx, 2019), it can be assumed that this non-integrated affective charge becomes the basis for the formation of a psychosomatic symptom, acting as an intermediary link between the blocked experience and subsequent neuroplastic changes.

To elucidate the regularities of the somatic incorporation of non-integrated affective experience, an analysis of the mechanisms of interoception is critical. According to the research of A. Craig (Craig, 2009), interoception emerges as a continuous representation of the body's internal states within the insula of the brain. This structure functions as an integrative interface where the perception of visceral signals is

combined with cognitive processing, forming the subjective architecture of self-awareness in the present moment. In cases of persistent fixation of the emotional cycle at the stage of maximum arousal, the neural networks of the insula may perform a recalibration of homeostatic parameters, perceiving the state of hyperreactivity as a new basal level of functioning, which determines the development of prolonged autonomic dysregulation.

This mechanism of implicit body memory was detailed by Bessel van der Kolk (Van der Kolk, 2014), who substantiated that when the verbal integration of experience is impossible, the body literally "keeps the score" of every unprocessed emotion. Fixation occurs in the form of chronic muscular armor and changes in the functioning of visceral systems. Thus, a somatic symptom should be viewed not as an accidental pathology but as the most accurate, albeit non-verbal, form of preserving the emotional experience that failed to reach its conclusion.

From the perspective of affective neuroscience, such fixation can be viewed as a rigid biological prediction. If an emotional wave was not completed adaptively, the brain continues to generate predictions regarding threat, relying on signals from the body that remain in a state of mobilization. Muscular armor, respiratory rhythm disruptions, or visceral symptoms become non-verbal representations of this past experience being reproduced in the present.

Thus, somatization is a form of implicit preservation of an emotion which, due to a lack of cognitive-affective integration, was not converted into an autobiographical memory.

The significance of reflections on interoception and body memory for substantiating the polymodal approach lies in understanding the physical nature of psychological fixation. A somatic symptom is not an accidental manifestation, but a complex neurobiological substrate that holds the emotional cycle at its point of rupture. This provides grounds to assume that a comprehensive therapeutic intervention aimed at the reconstruction of experience must necessarily include work with interoceptive awareness. Only through restoring contact with somatic signals and their novel

cognitive categorization does it become possible to unblock "frozen" implicit memory, which creates the necessary conditions for its subsequent neuroplastic transformation.

The rigid biological prediction, formed at the level of central integration nodes, is realized through systemic changes in the functioning of the autonomic nervous system. A comprehensive neurophysiological model explaining the mechanisms of such systemic stagnation is offered by Stephen Porges's polyvagal theory (Porges, 2011). According to this concept, the operation of the autonomic nervous system is not limited to the classical dichotomy of sympathetic and parasympathetic activity, but is subordinated to an evolutionarily determined hierarchy of three neural circuits, each of which determines a specific adaptation strategy.

The central construct of polyvagal theory is neuroception—a continuous subcortical evaluation by the nervous system of markers of safety, danger, or vital threat. Under conditions of the neuroception of safety, the evolutionarily newest circuit dominates—the myelinated ventral vagal complex. It ensures a state of social engagement and optimal homeostasis, and creates the necessary foundation for the adaptive processing of emotional experience.

In the event of danger (during the onset phase of the emotional wave), the sympathetic nervous system is activated, triggering the mobilization strategy. Normally, after overcoming the threat and reaching the affective peak, the system should undergo physiological recovery, returning to ventral vagal dominance. However, if the stressor proves excessively intense or discharge is interrupted, the system may transition to the evolutionarily oldest defense mechanism—the activation of the unmyelinated dorsal vagal complex. This leads to an immobilization response, freezing, and profound psychophysiological dissociation (Porges, 2011).

In the context of affective chronometry, polyvagal theory allows for the rationale of the phenomenon of biological time stopping during psychological trauma. If the emotional cycle was not integrated, the mechanisms of neuroception undergo persistent dysregulation: the nervous system loses the ability to correctly recognize markers of safety in the present time. Objective chronological time continues its course, yet the

biological time of the autonomic nervous system remains fixated at the moment of the past threat.

Consequently, the individual's organism continues to function in a mode of chronic sympathetic hypermobilization or dorsal freezing. Such prolonged autonomic dysregulation renders the natural completion of the emotional wave impossible, as cognitive attempts to reframe the experience are blocked by afferent signals from the body indicating threat.

Prolonged autonomic dysregulation, caused by the impossibility of adaptively completing the emotional cycle, leads to systemic exhaustion of the organism. To describe the physiological cost of chronic stress, the concept of allostatic load is utilized (McEwen, 1998). Allostasis represents the maintaining stability through active physiological changes—for example, a sustained increase in blood pressure or cortisol levels to meet vital needs under conditions of threat. According to the energetic model of stress (Ellis et al., 2019; Bobba-Alves et al., 2022), the constant conscious suppression of affect and the inhibition of its expressive component require a colossal expenditure of metabolic resources, leading to critical exhaustion of the neuroendocrine and immune systems.

However, it is important to emphasize that the transformation of an interrupted emotional experience into a clinical somatic symptom is not an instantaneous act. It is a complex, time-extended process that possesses its own chronological architecture. From the perspective of cognitive psychology (Smulson, 2020), when confronted with non-integrated experience, the psychological system initially makes intensive attempts at its semantic reconstruction. A search for pathways to cognitively complete the interrupted emotional dynamics occurs.

At the neurobiological level, this stage is explained by the perseverative cognition hypothesis, developed by J. Brosschot and J. Thayer (Brosschot, Gerin, & Thayer, 2006). According to this concept, given the incompleteness of the emotional discharge, the cognitive system initiates a constant mental reproduction of the stressor in the form of ruminations, intrusive memories, or anxious expectations. The essence of the problem lies in the fact that these attempts at cognitive integration reactivate the

corresponding autonomic response each time: the brain reacts to an imagined threat just as it does to a real one. Instead of the anticipated adaptive completion, the phenomenon of emotional inertia is formed (Trull et al., 2015)—a persistent resistance of the affective system to change, which artificially prolongs physiological arousal over time.

Only after a series of attempts at cognitive assimilation of the experience fails, and the level of allostatic load exceeds the organism's adaptive capacities, does the pathological process manifest at the visceral level. A comprehensive explanation of the mechanisms and temporal regularities of such manifestation is offered by the chronopsychological approach, particularly the concept of forecasting the course of psychosomatic diseases developed by I. I. Savenkova (Savenkova, 2018). According to this paradigm, the development of somatic pathology is strictly subordinated to the regularities of the individual's biological life cycle.

Of particular importance in this unfolding are bifurcation points—specific, mathematically calculable age and time intervals of the system's maximum psychophysiological instability. It is precisely during these critical periods of the biological clock that the accumulated allostatic load, generated by prolonged perseverative cognition and unprocessed affects, finally overcomes the organism's compensatory barriers. The tension, which until this moment had been held in a latent state or manifested exclusively as psychological distress, converts into a pronounced disease. Furthermore, contemporary research (Savenkova, 2018, 2020) demonstrates the existence of a stable correlation between the subject's typological affiliation and the specificity of the somatic target, which explains the selective impairment of certain systems (for example, cardiovascular or gastrointestinal) across different chronotypological groups.

Summarizing this mechanism within the general concept of our study, a somatic symptom should be viewed not simply as a clinical diagnosis, but as the materialized consequence of halted psychological time. When the natural temporal architecture of the affective wave undergoes a rupture, the non-integrated tension does not dissipate but crystallizes in the form of persistent autonomic patterns. A fundamental

chronological dissonance arises: the cognitive instance is forced to adapt to the objective present, while its physiological substrate remains blocked in the moment of the past experience. Accordingly, overcoming such a rigid psychosomatic fixation requires not an isolated pharmacological or rational suppression of the symptom, but the reactivation and ecological completion of the interrupted temporal dynamics. It is precisely this process of unblocking subjective time that can allow the system to achieve the adaptive finale it has persistently, albeit maladaptively, sought, thereby creating the possible foundation for subsequent neuroplastic transformation.

Thus, the somatic dimension of emotional experiences emerges not as a passive response, but as an active predictive system. Psychosomatic fixation during an incomplete emotional wave is the result of the rupture of multimodal integration and the halting of subjective time at the level of the brain's visceral maps. Understanding the body as a plastic system capable of regeneration and updating its regulatory patterns allows us to view somatic unblocking as a necessary stage for triggering neuroplastic changes. This creates a bridge to the analysis of the mechanisms of neural reconstruction of experience, which will be detailed in the following section.

The synthesis of theoretical and empirical material regarding the somatic dimension of affective states allows for the assertion that emotional experience is an integrated cognitive-somatic process that is inseparable from its physiological substrate. Interoceptive mechanisms play a fundamental role in this multidimensional integration. It is the perception of visceral signals, processed in central brain hubs—particularly the insula—that organically merges with cognitive appraisal to form the subjective architecture of an individual's self-awareness in the present moment.

The insula acts as the central neuroanatomical hub of this process. It functions as the primary zone for integrating sensory information from the internal organs into a coherent sense of "Self" (Damasio, 2010). The anterior insula plays a critical role in somato-cognitive convergence: here, visceral signals (heart rate, breathing depth, gastrointestinal sensations) are transformed into subjective feelings and emotional states. When this interoceptive flow is congruent, the individual maintains adaptive contact with reality. However, under conditions of an incomplete emotional wave,

insular activity is distorted: it begins to transmit threat signals even in the absence of an external stimulus, which becomes the neurobiological foundation for chronic psychosomatic anxiety.

In this context, psychosomatic symptomatology emerges not as a secondary consequence of stress, but as a specific form of implicit memory and the logical result of halted subjective time. The fixation of the emotional cycle at the arousal stage leads to the formation of a rigid biological prediction. The autonomic nervous system adapts to a state of chronic danger through persistent patterns of mobilization or dorsal freezing, thereby transforming the body into a physical container for autonomic tension that has not found its adaptive ecological completion in the form of a completed wave.

Within the framework of the author’s incomplete emotional wave (IEW) model (Malyhina & Savenkova, 2026), this process acquires the features of specific autonomic "looping." Instead of passing through the normative "reactivity–recovery" cycle, the autonomic nervous system gets stuck in a state of chronic sympathetic mobilization (manifested through tachycardia, shallow chest breathing, and muscle hypertonicity) or parasympathetic dorsal collapse (numbness, apathy, and dissociation from bodily sensations). This state creates continuous "somatic noise" that exhausts the organism's adaptive resources. The prolonged fixation of these patterns leads to the formation of a persistent "body memory" of the unprocessed event, where the somatic reaction gradually transforms into a chronic symptom.

It should be emphasized that the transformation of such an interrupted affect into a clinical symptom is a complex and time-extended process. Attempts by the cognitive system to independently complete the experience through perseverative cognition and ruminations largely artificially maintain physiological activation. This continuous activation generates a critical allostatic load that finally overcomes the organism's compensatory barriers during specific chronopsychological periods of maximum instability, conceptualized as bifurcation points of the grand biological life cycle.

Consequently, bodily integration and the ecological completion of the interrupted temporal dynamics of emotion emerge as mandatory and irreplaceable prerequisites for qualitative psychological transformation. Since blocked experience is implicitly held

within autonomic reactions, rational reappraisal of the problem alone is insufficient for changing stable neurobiological connections. It is through deep bodily integration—restoring the connection between the cognitive narrative and somatic sensation—that the necessary foundation is created for the structural reconstruction of memory through its reconsolidation. Such unblocking of the somatic component provides direct access to the mechanisms of brain neuroplasticity, a thorough analysis of which is the subject of the next section of our work.

2.4. Neuroplasticity and integration: mechanisms of affective experience reconstruction

Understanding the somatic nature of emotional stagnation, as examined in the previous section, presents researchers with a fundamental question regarding the mechanisms for overcoming it. According to the polymodal approach, an effective exit from a state of psychosomatic fixation lies primarily in the initiation of neuroplasticity processes. For a long time, it was believed that neural connections formed in adulthood, especially those encoding traumatic experience, were static. However, the discovery of the memory reconsolidation phenomenon fundamentally changed this paradigm (Nader & Hardt, 2009).

Reconsolidation proves that during each retrieval (actualization) of a memory, the corresponding neural trace transitions from a fixed state to a labile (vulnerable) one. During this brief period—the "plasticity window"—memory can be modified, updated, or even erased before consolidating once again (Lane, 2020). From a neurobiological perspective, memory destabilization requires the activation of NMDA receptors (the glutamate system), and the subsequent preservation of the updated experience requires de novo protein synthesis in the synapses. This implies that psychological integration is a material restructuring the brain's microstructure.

A central condition for triggering reconsolidation mechanisms is the creation of an intense corrective experience, which B. Ecker conceptualized as a "mismatch" or "prediction error" (Ecker, Ticic, & Hulley, 2012). According to his model, to destabilize an old memory trace, it is not enough to simply recall a traumatic event;

one must simultaneously undergo an experience that directly and undeniably contradicts the expected threat.

Within the framework of the polymodal approach and our incomplete emotional wave (IEW) model (Malyhina & Savenkova, 2026), this prediction error must be created at a deep somatic level. To destabilize the rigid IEW pattern, the actualization of old affective content must occur against the background of a fundamentally new physiological state—ventral vagal safety.

When the brain cognitively predicts danger (through memory activation) but simultaneously receives interoceptive signals from the insula indicating body relaxation, a steady heart rate, and deep breathing, the critical mismatch described by Ecker arises. This profound polymodal prediction error acts as a biochemical trigger, signaling the hippocampus and amygdala to update the database. The incomplete wave finally receives its ecological finale, and the system rewrites the somatic marker of threat into a marker of safety.

A central condition for triggering reconsolidation mechanisms is the creation of an intense corrective experience, conceptualized by B. Ecker as a prediction error (Ecker, Ticic, & Hulley, 2012). For a long time, the prevailing view in psychological practice was that providing a subject with a new cognitive insight was sufficient for reframing a problem. However, in light of polyvagal theory and the theory of constructed emotion, it becomes evident that purely intellectual dissonance is incapable of destabilizing deep affective networks. Corrective experience must be deeply embodied, meaning it must encompass all levels of emotion construction.

To initiate structural changes, synchronous activation of three fundamental modalities—cognitive, somatic, and affective—is required. At the cognitive level, the old maladaptive narrative is actualized: the system reactivates the habitual pattern of reaction and the expectation of threat. However, the key transforming factor is the somatic level. Drawing on S. Porges's model, it can be argued that old experience must be reactivated exclusively against the backdrop of the dominance of the ventral vagal complex, which ensures a physiological state of deep safety and social engagement.

It is precisely the discrepancy between the actualized cognitive expectation of danger and the real interoceptive signals of somatic safety in the present time that creates the critical mismatch stimulating the cognitive system to revise the old prediction as irrelevant. The affective level in this multimodal architecture acts as an energetic catalyst: the new emotional valence consolidates the updated synaptic connection. The synchronous integration of these modalities reproduces the natural mechanism of emotion formation, creating optimal prerequisites not merely for compensating the traumatic trace, but for a profound alteration of its neurobiological structure.

Traditional approaches to psychological correction, particularly classical cognitive-behavioral therapy and exposure methods, have long relied on the mechanism of extinction. This mechanism involves the formation of new, safe associations over the old traumatic trace. However, contemporary research in the neurobiology of memory (Nader, Schafe, & LeDoux, 2000) has proven that extinction does not erase the primary emotional experience, but merely creates a parallel inhibitory circuit. This explains the high probability of psychosomatic symptom relapse under the influence of stressors. Genuine structural transformation and the final resolution of persistent autonomic tension require the activation of a different neurobiological mechanism—memory reconsolidation.

According to the fundamental works of Eric Kandel (Kandel, 2001), reconsolidation biochemically transitions an activated neural trace into a labile, unstable state into a labile, unstable state. The researcher demonstrates that during this period of plasticity, which lasts for several hours following reactivation, synaptic connections can be physically restructured through the synthesis of new proteins. However, the cognitive actualization of a memory does not, in and of itself, trigger this restructuring process. Without additional conditions, the memory simply reconsolidates in its original form, which in clinical practice often leads to retraumatization.

According to the research of neurobiologists, particularly Richard Lane and co-authors (Lane et al., 2015), a central prerequisite for opening the reconsolidation window is the creation of an intense corrective experience that forms the phenomenon of prediction error. In the context of Karl Friston's predictive coding theory (Friston, 2010), the brain

is viewed as a hierarchical hypothesis-testing system that strives to minimize uncertainty. Psychosomatic fixation acts as an extremely rigid a priori prediction regarding the inevitability of threat, which ignores new sensory data. For the cognitive system to recognize this prediction as irrelevant and sanction synaptic changes, it must encounter a radical discrepancy between expectation and reality. Bruce Ecker (Ecker, Ticic, & Hulley, 2012) conceptualized this process as a mismatch experience, which acts as the necessary trigger for destabilizing the affective modifications of the emotional memory trace.

The specificity of processing incomplete emotional waves lies in the fact that purely intellectual dissonance is incapable of providing such a prediction error for subcortical structures, particularly the amygdala. Initiating structural changes requires a multimodal architecture of corrective experience, involving the synchronous activation of cognitive, affective, and somatic modalities. At the cognitive level, a controlled actualization of the maladaptive narrative occurs—the system reactivates the expectation of danger. Simultaneously, the somatic level acts as the key transforming factor. Drawing on Stephen Porges's model of polyvagal regulation, actualization must be accompanied by the dominance of the ventral vagal complex.

According to Anil Seth's contemporary models of interoceptive predictive coding (Seth, 2013), it is precisely the deep interoceptive signals of safety and physiological homeostasis that, by entering into direct conflict with the cognitive expectation of threat, create the necessary critical prediction error at the somatic level. The brain receives undeniable physiological proof that the past threat is no longer relevant. This multimodal integration is also closely linked to the processes of interhemispheric interaction explored by Louis Cozolino (Cozolino, 2017). In his works, he notes that corrective experience must unite the affective-somatic content, which is predominantly processed by right-hemisphere structures, with the verbal-narrative constructs of the left hemisphere. The synchronous merging of these modalities mirrors the natural mechanism of emotional regulation, allowing isolated somatic reactions to be converted into a coherent autobiographical experience.

According to our proposed model (Malyhina & Savenkova, 2026), the logical result of multimodal reconsolidation is the restoration of the natural chronometry of the affective process. Within the concept of the incomplete emotional wave (IEW), psychosomatic fixation is interpreted as a specific form of temporal anomaly. Based on the analysis of somatization mechanisms presented in the previous sections, it can be assumed that an interrupted emotional cycle determines a state of emotional inertia. Under such a condition, affective reactivity loses its adaptive flexibility, which theoretically can lead to the stagnation of the system in the phases of sympathetic mobilization or dorsal freezing. The ecological completion of the cycle entails creating conditions for exiting this stagnation and transitioning to the recovery phase.

For a deeper rationale of this process, it is expedient to turn to Edmund Husserl's phenomenology of internal time-consciousness. According to his theory, the typical structure of a temporal object predominantly consists of primal presentation, retention, and protention. It can be hypothesized that in a state of psychosomatic fixation, retention (the retaining of what has just passed) becomes overloaded with non-integrated affective content. This, in turn, is capable of distorting protention—the system's ability to anticipate the future—forcing the subject to expect a repetition of the traumatic experience. Relying on Boris Tsukanov's concept of the intrinsic unit of time (Tsukanov, 2000), we assume that the ecological completion of the IEW facilitates the resynchronization of the individual's biological clock, returning subjective time from the cyclical reproduction of the past to a linear unfolding.

The research of Iryna Savenkova (Savenkova, 2018) confirms that a prolonged existence in a state of temporal rupture exhausts the organism's adaptive resources. It is theoretically substantiated that multimodal integration allows the subject to complete the retentional cycle, transferring the experience from the category of an ongoing incomplete process to the category of the integrated past. The ecological nature of such completion is determined by adherence to the sequence of biological phases: full semantic assimilation of experience becomes possible primarily after the autonomic wave has reached its physiological decline.

Within this approach, the structural completion of the emotional cycle can not only contribute to a reduction in allostatic load but also create the prerequisites for changing the quality of memory encoding in the structures of the hippocampus and prefrontal cortex. In the context of Philip Zimbardo's time perspective theory (Zimbardo, 2008), this facilitates the transformation of a fatalistic attitude toward the past toward a balanced perception of the present. According to our model, such unblocking of the subjective temporal continuum is a probable platform for subsequent neuroplastic transformation, allowing the system to restore its capacity for adaptive future planning.

One of the most complex and least researched aspects of affective dynamics is the question of the temporal periodicity of the reproduction of non-integrated experience. Within our proposed incomplete emotional wave model, we assume that the recurrence of affective and somatic symptoms is not a chaotic process but is subordinated to certain internal rhythms of the system. The organism not only preserves information about the interrupted cycle in the form of implicit memory but also actively utilizes maximally similar external and internal conditions as a specific context in an attempt to reproduce, re-experience, and ecologically complete the incomplete emotional wave.

This phenomenon can be theoretically substantiated through the concept of the anniversary syndrome, described in the works of Anne Ancelin Schützenberger (Schützenberger, 1998). The researcher demonstrates the existence of stable temporal links between a traumatic event and subsequent clinical manifestations, indicating the existence of certain macrocycles in the functioning of the psyche. However, in our view, these cycles possess not only an event-driven but also a fundamental neurobiological substrate associated with the individual's intrinsic unit of time.

Relying on the fundamental research of B. Y. Tsukanov (Tsukanov, 2000), we can hypothesize that the individual time constant τ acts as the base moderator of the reverberation frequency of the incomplete emotional wave. If the emotional wave has not reached the phase of physiological and cognitive resolution, it transforms into a stable neural loop that possesses its own oscillation frequency. It can be assumed that the repetition period of such a wave is a multiple of the individual's tau-type. This

creates the theoretical possibility for future mathematical modeling of the moments of maximum risk of psychosomatic manifestation.

An important step in the development of this direction is the consideration of bifurcation points, mathematically substantiated in the works of I. I. Savenkova (Savenkova, 2018; 2020). According to these studies, there are specific temporal intervals of maximum system instability during which the accumulated allostatic load from incomplete emotional waves is most likely to lead to a somatic breakdown. The combination of Tsukanov's individual time constant and Savenkova's forecasting algorithms allows us to conceptually propose a formula for the temporal resonance of the incomplete emotional wave. In this model, the moment of relapse is viewed as a function of the time of primary fixation, the subject's intrinsic unit of time, and the allostatic load coefficient.

The aforementioned periodicity plays the role of a biological mechanism of homeostatic search. The system strives for the completion of the cycle, and each new iteration of the incomplete emotional wave is a potential window of opportunity for the reconsolidation of experience. However, without external intervention or the emergence of new resources, the system often falls into a pathological attractor, where, instead of completion, predominantly a repeated consolidation of the maladaptive pattern occurs. Thus, the mathematical determination of the activation periods of the incomplete emotional wave is a strategic task for contemporary psychotherapy, as it allows for the prediction of periods of maximum system plasticity, when intervention will be most effective for the final integration of experience.

Conclusions to Section 3

Summarizing the results of the analysis of neuroplastic and integrative mechanisms of affective experience reconstruction, we can assert that overcoming the incomplete emotional wave acts as a central factor in restoring the individual's psychosomatic integrity. Based on the reviewed material, it is theoretically substantiated that this process is based not on the simple repression or inhibition of maladaptive reactions, but on the fundamental biochemical and structural mechanism of memory reconsolidation. Unlike classical models of extinction, reconsolidation allows the

neural trace to transition into a labile state, opening a window of opportunity for the physical restructuring of synaptic connections. A key condition for triggering such transformation is the creation of an intense corrective experience, which, through the mechanism of prediction error, destabilizes the brain's rigid biological predictions.

An important conclusion of this section is the confirmation of the necessity of a multimodal architecture for therapeutic intervention. The synchronous activation of cognitive, affective, and somatic modalities allows the system to receive direct somatic proof of safety at the moment of activating the traumatic experience. Drawing on the model of ventral vagal regulation, we assume that it is precisely this state of physiological homeostasis that enters into a critical dissonance with the cognitive expectation of threat, which becomes the trigger for updating affective networks. Such an approach makes it possible to move beyond purely verbal correction, engaging subcortical brain structures in the rewriting emotional meanings.

A special place within our concept is occupied by the question of the chronodynamic periodicity of the incomplete emotional wave. Theoretical analysis provides grounds to assume that the cyclical return of affective symptomatology is not accidental but correlates with the subject's individual biological constants, particularly with their intrinsic unit of time and the bifurcation points of their biological cycle. We view these relapses as specific attempts by the system toward self-restoration through the search for maximally similar conditions to complete the emotional cycle. Our proposed hypothesis regarding the mathematical predictability of the moments of IEW activation creates a fundamental basis for further empirical research aimed at developing precise algorithms for determining periods of maximum neuroplastic vulnerability and system plasticity (Malyhina & Savenkova, 2026).

The final stage of transformation is the integration of the updated experience into the structure of the self-concept. According to the regularities of the cognitive evaluation of past experience, the formation of an adaptive affective finale to the wave allows the system to revise the overall evaluation of the event in autobiographical memory. The state of somatic calm and completion becomes a new marker of experience, facilitating the restoration of interhemispheric connectivity and the formation of a coherent life

narrative. Thus, the transition from stagnation to the ecological completion of the emotion's temporal cycle acts largely not only as symptomatic treatment but as an act of restoring the subjective temporal continuum, which is a necessary condition for the development of the individual's psychological resilience and their capacity for future adaptation.

Consequently, the neuroplastic reconstruction of emotional experience is a complex biological act that requires the coordinated operation of cognitive, affective, and somatic systems. Overcoming the consequences of an incomplete emotional wave lies not in the realm of avoiding triggers, but in the realm of creating conditions for safe reconsolidation. Ensuring polymodal integration during the actualization of experience makes it possible to modify the predictive models of affective response, transforming psychosomatic vulnerability into psychological flexibility and resilience.

2.5. The algorithmic basis of the methodological model of polymodal intervention based on process-based therapy

The application of the polymodal approach in the context of the neuroplastic reconstruction of experience requires a transition from static therapeutic protocols to a dynamic model of processes of change. The methodological model of such an intervention is based on the principles of process-based therapy, where the focus is not the treatment of a symptom but the modification of functional connections between key dimensions of the individual's psychological functioning. Within the proposed algorithm, the cognitive-affective axis is aimed at destabilizing the rigid predictive models that hold the system in a state of the incomplete emotional wave. The cognitive modality is viewed as a hierarchical system of predictions, where clinical work focuses on identifying cognitive rigidity—when the brain ignores new data regarding safety in favor of outdated affective markers of threat. The use of cognitive defusion techniques allows for reducing the weight of maladaptive predictions, preparing neural networks for the processes of memory reconsolidation.

In parallel, the somatic-interoceptive axis ensures work with the autonomic substrate through a targeted influence on the interoceptive signals of the insula. The goal of this

stage is to shift the autonomic nervous system from a state of chronic sympathetic mobilization or dorsal freezing into a state of ventral vagal safety (Porges, 2011). Without proper stabilization of the somatic component, an attempt to actualize the incomplete emotional wave may cause a repeated psychosomatic fixation of threat, as the system perceives the memory as a real danger in the present time.

Further deepening of the methodological stage of somatic stabilization allows for revealing the complex mechanisms of preparing the nervous system for the subsequent neuroplastic restructuring of experience. Within the polymodal approach, ventral vagal stabilization is viewed not as a passive state of relaxation but acts as an active predictive validation of safety (active interoceptive inference). The creation of a stable somatic foundation of safety is a critical condition for the emergence of a prediction error. The temporal axis of intervention ensures the resynchronization of the individual's subjective time through the processing of the affective chronometry of the experience. Therapeutic influence is viewed as a tool for restarting the interrupted emotional wave, which allows the patient to complete the temporal cycle of affect and integrate the experience into the structure of a coherent narrative self.

When therapeutic intervention is aimed at changing the state of the autonomic nervous system, the insula begins to receive a massive flow of updated interoceptive signals regarding the change in the visceral landscape, which leads to a gradual decrease in the precision weighting of the old threat prediction. From the perspective of affective neuroscience, this process is critical as it alters the hierarchy of information processing in the brain, where signals of current safety begin to dominate over the inertial models of past fear. An important aspect of this stage is the development of the individual's interoceptive accuracy, where they learn to identify and differentiate the slightest changes in their own somatic background, allowing them to act not as a passive object of affective hijacking but as an active subject of their own biological regulation.

Such preventive work with the somatic dimension maintains stability of the system during the subsequent phase of activating the incomplete emotional wave, preventing repeated dissociation or autonomic collapse. We assert that the formation of a somatic foundation of safety is not merely a preparatory procedure but an independent

neuroplastic act that initiates the restructuring of the brain's interoceptive maps even before the direct processing of the traumatic content. This allows the system to accumulate sufficient resources to withstand intense affect during the creation of a prediction mismatch situation, which is a guarantee of the successful updating of the emotional memory trace within the reconsolidation window and the ultimate restoration of the individual's mental health (Malyhina & Savenkova, 2026). The organic inclusion of the somatic modality as the primary chain of changes allows the therapeutic process to be transformed from the plane of verbal persuasion to the plane of direct biological experience, which significantly increases the effectiveness of the intervention under conditions of chronic stress.

A central component of the presented model is the stage of synchronous actualization of experience and the creation of a prediction error. The goal of this manipulation is to transition the neural trace of the incomplete emotional wave from long-term memory into a labile state. According to Bruce Ecker's concept, initiating memory reconsolidation requires providing a mismatch experience that directly contradicts the system's key prediction (Ecker et al., 2012). This work simultaneously engages three modalities. Affective activation involves a guided reproduction of the peak moment of the incomplete wave, with precise dosing of the arousal level to activate the brain's glutamate system. Simultaneously, an intense signal of somatic safety is introduced through interoceptive channels. The patient maintains a dual focus of attention, experiencing the past threat against the background of current physical calm. The moment when the prediction of danger collides with the real interoceptive sensation of stability is the point at which a critical prediction error occurs.

Such systemic dissonance destabilizes the neural loop of the incomplete emotional wave, creating a plasticity window for the structural restructuring of experience. As M. Piñeyro and her colleagues demonstrate in their empirical research, the purposeful induction of a positive or safe somatic state during memory reactivation can effectively interrupt the reconsolidating negative autobiographical memories (Piñeyro et al., 2018). During this interval, synaptic connections become accessible for rewriting, allowing the system to update its database and replace the somatic marker of threat with a marker of resilience. The completion of the emotional cycle under such

conditions ensures the formation of an adaptive predictive model, where the old memory of blocked affect is transformed into a resource of psychological resilience. This algorithm transforms the therapeutic space into a methodological platform for initiating neuroplastic changes, where the ultimate reconstruction of maladaptive experience occurs through the conscious creation of a mismatch (Malyhina & Savenkova, 2026).

A separate and extremely important component of the successful implementation of the polymodal intervention algorithm is the state of the practitioner themselves and the neurobiological mechanism of therapeutic co-regulation. From the perspective of polyvagal theory, the neuroplastic reconstruction cannot occur in a social vacuum, as the human nervous system is evolutionarily tuned to seek markers of safety through contact with another person (Porges, 2011). In the state of an incomplete emotional wave, when the patient's predictive system generates false signals of threat, the capacity for self-regulation is critically diminished. Under these conditions, the therapist's ventral vagal tone acts as an external biological resource that allows the client's system to recalibrate its own interoceptive maps. This process is known in interpersonal neurobiology as limbic resonance or right-hemisphere communication, where the practitioner's physiological calm, breathing rhythm, vocal timbre, and facial expressions are read by the patient's neuroception as undeniable evidence of safety (Cozolino, 2017).

The creation of a prediction error, which is necessary for opening the reconsolidation window, is impossible if the therapist themselves is in a state of sympathetic mobilization or anxiety. If the practitioner's cognitive narrative broadcasts safety while their somatic state betrays tension, the patient's system will read this dissonance and block neuroplasticity processes, perceiving the situation as potentially dangerous. Therefore, the methodological model of polymodal intervention demands a high level of interoceptive awareness from the specialist and the ability to consciously manage their own affective chronometry. The therapist essentially rents their own nervous system to the patient in order to safely guide them through the peak of reactivity to the ecological finale of the wave. Once a state of physiological homeostasis is achieved through joint efforts, the updated experience is integrated, and the patient regains the

capacity for autonomous self-regulation, freeing themselves from dependence on the external therapeutic resource.

The final stage of integrating emotional experience into the personality structure requires analyzing how implicit autonomic reactions convert into a coherent explicit autobiographical narrative into a coherent explicit autobiographical narrative. Within the concept of the incomplete emotional wave, this transition signifies the final unblocking of the individual's subjective time, where the event loses its status as a traumatic present and becomes part of the integrated past. Neurobiologically, this process is ensured through the restoration and enhancement of functional connectivity between the structures of the hippocampus and the prefrontal cortex. Prior to the completion of the emotional wave, the memory exists in the form of fragmented sensory and somatic imprints that are stored predominantly in the amygdala and right hemisphere without proper temporal and contextual fixation. Only after the affective cycle reaches its physiological finale through polymodal integration does the hippocampus gain the opportunity to assign a unique temporal tag to the event and transfer it into long-term storage mode.

The prefrontal cortex, in turn, performs higher cognitive processing of this experience, transforming the primary somatic affect into a complex semantic structure that is organically embedded into the individual's self-concept. This leads to the restoration of the temporal integrity of life, where the individual gains the ability to freely operate with their own past as a resource without being in inertial dependence on incomplete affective circuits. An important consequence of such integration is a change in prospective thinking strategies, where the individual begins to model the future based on predictions of safety and resilience rather than through the projection of past threat. Thus, neuroplastic reconstruction completes the full cycle of experience transformation, turning implicit somatic vulnerability into a conscious cognitive asset. This confirms our thesis that mental health is a derivative of the system's capacity for the continuous integration of multimodal experience into a consistent and dynamic structure of self-awareness, which ensures the individual's resilience to destructive environmental influences.

Clinical Vignettes

To illustrate the outlined theoretical provisions and demonstrate the practical mechanics of polymodal integration, it is expedient to examine the clinical phenomenology of the incomplete emotional wave using real-world case studies. The analysis of these cases allows us to trace both the depth of psychosomatic fixation and the neuroplastic reconstruction of experience under the conditions of creating a prediction mismatch.

The first clinical vignette illustrates a scenario of temporal displacement and affective inertia during retraumatization. A female patient sought psychological help in a state of acute grief following the sudden loss of her husband. A phenomenological analysis of her state revealed a depth of somatic collapse and a total loss of basic trust in the world that was atypical for a normative grieving process. An exploration of her autobiographical memory allowed for the identification of a primary incomplete emotional wave associated with the death of her mother, which the patient experienced at the age of seven. In childhood, the intensity of the affect significantly exceeded the adaptive capacities of the nervous system, which led to a dorsal blocking of the experience and a freezing of the somatic reaction. The loss of her husband in adulthood acted as a powerful neurobiological trigger that actualized an identical neural network. The nervous system began generating reactions not only to the current stressful event but also processing the massive volume of blocked childhood affect. This vividly illustrates the phenomenon of temporal displacement, where the patient's subjective time collapsed, merging the past and present losses into a single monolithic psychosomatic construct. Therapeutic intervention in this case required a filigree separation of these two contexts in time to create a safe space where the primary childhood wave of grief could reach its ecological completion without additionally overloading the system with the current event.

The second clinical vignette demonstrates a scenario of successful somatic reconsolidation and the revelation of a hidden attractor under conditions of acute macrosocial stress. While in a shelter during the intense operation of air defense systems, a female patient noted a striking discrepancy between her rational

understanding of the situation and an excessive visceral reaction of terror. The physiological response bore the hallmarks of total helplessness and existential threat, which did not correspond to the objective level of safety in the shelter. In a state of high interoceptive awareness, a spontaneous actualization of implicit somatic memory occurred. The specific acoustic characteristic of the explosions was recognized by the brain as a pattern of loud parental screaming during an acute family conflict that the patient experienced at the age of two or three. From the perspective of developmental neurobiology, for a child's nervous system, the uncontrolled screaming of the adults upon whom their physical survival depends is perceived with the same intensity of biological threat as actual explosions are for an adult.

The awareness of this neural connection created ideal conditions for the emergence of a critical prediction error. The patient's adult self-concept, which at that moment relied on stable ventral vagal regulation, encountered the actualized childhood affect. The discrepancy between the implicit childhood prediction of inevitable demise and the current adult somatic sensation of resilience initiated the opening of a plasticity window. This allowed the nervous system to sever the pathological synaptic connection between the unpredictable loud noise and somatic collapse, ensuring the final integration of the early experience. The completion of this archaic emotional wave led to a significant reduction in the acuity of physiological reactions to the current wartime stressors.

A comparative analysis of these cases empirically confirms that overcoming psychosomatic fixation requires not merely a cognitive insight, but a profound somatic destabilization of the outdated prediction. The effectiveness of the polymodal approach is due to its ability to engage the fundamental mechanisms of reconsolidation through the creation of a mismatch experience, which allows the nervous system to rewrite the architecture of maladaptive connections and restore the natural tempo-rhythm of psychological life.

2.6. Discussion

The results of the conducted theoretical analysis allow us to assert that the problem of preserving and restoring mental health requires a transition from fragmentary models

to a holistic polymodal paradigm. Viewing emotional experience as a complex multimodal architecture fundamentally changes the understanding of the mechanisms of psychosomatic fixation.

Analyzing the advantages of the polymodal paradigm requires a preliminary consideration of the theoretical contributions of classical monomodal schools, which laid the methodological foundation of modern psychological science. Each of these approaches made a revolutionary breakthrough by focusing on a specific modality of human experience, which subsequently allowed for the formation of the groundwork for their synthesis.

Sigmund Freud's psychoanalytic approach became the first large-scale attempt to substantiate the role of unconscious affective conflicts in the genesis of somatic symptoms. Investigating the mechanisms of conversion, psychoanalysis revealed that an unreleased affect is capable of transforming into a physical disorder, effectively laying the foundation for understanding implicit memory and preverbal forms of experience preservation. Modern neurobiology largely confirms these early achievements, viewing primary processes as subcortical activity that precedes conscious awareness.

The further development of psychological thought in the form of Aaron Beck and Albert Ellis's cognitive approach introduced the principles of empirical rigor and evidence-based practice into the therapeutic discourse. The cognitive school detailed the role of mental schemas and automatic thoughts in the regulation of emotional states, demonstrating the mechanisms of the cognitive modality. It was proven that the subjective interpretation of an event is the determining factor of the affective response, which later became the basis for understanding top-down processes of emotion regulation.

In parallel, the body-oriented schools of Wilhelm Reich and Alexander Lowen shifted the research focus directly to the somatic substrate of the psyche. The conceptualization of muscular armor as the physical embodiment of a system of psychological defenses allowed the body to be viewed not as a passive object, but as an active source of psychological information. These schools became the precursors of modern concepts

of embodied cognition, indicating that persistent emotional patterns have their constant representation in muscle tone and autonomic reactions.

However, the current state of neurosciences indicates that monomodal focus on a single aspect has significant limitations. As Bessel van der Kolk notes, traumatic experience is not stored in the form of a coherent narrative; it is imprinted in autonomic reactions and sensory traces (Van der Kolk, 2014). Within our study, we assume that psychosomatic fixation is the result of the disintegration of the multimodal unity of experience. The use of the incomplete emotional wave model allows us to demonstrate how the interruption of the affective cycle leads to dissociation between the cognitive understanding of an event and its somatic substrate (Malyhina & Savenkova, 2026).

The scientific novelty of the proposed methodological model lies in its ability to overcome the limitations of monomodal approaches through a focused influence on reconsolidation processes. Unlike traditional cognitive-behavioral therapy, which often relies on mechanisms of extinction that do not guarantee a complete updating of memory, polymodal integration is aimed at the structural destabilization of the maladaptive attractor. The introduction of the somatic dimension as an equivalent component of the intervention allows for the engagement of subcortical brain structures in the rewriting emotional meanings. The question of the optimal duration of the plasticity window for various categories of psychosomatic disorders remains a subject of debate; however, the use of affective chronometry and the consideration of the individual's intrinsic unit of time create prospects for developing personalized algorithms of assistance. This confirms the thesis that the effectiveness of psychological transformation depends on the depth of synchronization between cognitive predictions and somatic markers of safety over time.

This perspective correlates with the later works of Antonio Damasio, where he details the role of the brain's interoceptive maps in the formation of consciousness and feelings (Damasio, 2010, 2018). The polymodal approach posits that the restoration of mental health is possible largely through the synchronous activation of the cognitive narrative and the somatic-affective sensation. It is a matter of discussion that without the engagement of a state of ventral vagal safety (Porges, 2011), cognitive restructuring

may remain a predominantly superficial compensation and fail to trigger the deep mechanisms of memory reconsolidation (Kandel, 2001; Lane et al., 2015).

A central aspect of our discussion is the temporal nature of emotional stagnation. We view the incomplete emotional wave as a dynamic temporal anomaly. Drawing on Edmund Husserl's phenomenology, it can be assumed that during an incomplete wave, an overloading of retention with unprocessed arousal occurs (Husserl, 1991). This creates the phenomenon of emotional inertia, described in predictive coding research as an excessively high weight placed on old predictions of danger (Friston, 2010; Seth, 2013). In contrast to the traditional understanding of stress, we propose viewing the incomplete wave as an internal attractor that loops the individual's subjective time. Such an approach allows for a novel interpretation of the accumulation of allostatic load, which, according to contemporary research by Bruce McEwen, leads to structural changes in the prefrontal cortex and hippocampus under the influence of chronic stress (McEwen, 2017). In this context, the developments of I. Savenkova and her colleagues are of utmost importance, proving that marginal allostatic load becomes a trigger for the manifestation of psychosomatic disorders, particularly cardiovascular and ischemic diseases, which are viewed as a consequence of the prolonged disorganization of the individual's affective-somatic unity (Savenkova et al., 2019).

Considering the prospects of applying the polymodal approach in broad clinical practice, it is necessary to objectively outline its methodological limitations and boundaries of applicability. The procedure of initiating memory reconsolidation through the creation of a prediction error requires the patient to possess a basic resource for maintaining a dual focus of attention. In cases of acute psychotic states, profound clinical depression, or massive dissociative disorders, where the capacity for interoceptive awareness is entirely blocked, the application of this algorithm may prove premature and requires prior long-term psychiatric stabilization. Furthermore, the reconsolidation mechanism is not adaptive in situations where an objective external threat continues to exist in real time. For example, under conditions of active combat operations or being at the epicenter of a disaster, sympathetic mobilization and the prediction of threat constitute not a psychosomatic fixation but a vital evolutionary reaction that ensures physical survival.

Attempts to artificially shift the system into a state of ventral vagal safety and complete the emotional wave prior to the elimination of the real stressor can lead to a decrease in the individual's adaptability and put them in danger. Polymodal integration and the alteration of predictive models make sense exclusively when past traumatic experience is projected onto an objectively safe present (Lane et al., 2015). Therefore, before commencing intervention, it is advisable for the practitioner to clearly delineate whether the patient's current anxiety is a consequence of affective inertia and an interrupted wave from the past, or if it is an adequate response to actual environmental challenges. This delineation is a critical ethical and methodological safeguard that guarantees the ecological application of neuroplasticity tools in the restoration of mental health.

The most promising issue in our section is the transition to the mathematical forecasting of emotional dynamics based on chronopsychological analysis. The use of the intrinsic unit of time, according to Boris Tsukanov (Tsukanov, 2000), in synergy with Iryna Savenkova’s conceptual principles regarding the determination of critical bifurcation points in an individual's biological cycle (Savenkova, 2018, 2020), creates a theoretical foundation for calculating periods of maximum somatization probability. We assume that the system actively seeks conditions to complete the emotional wave precisely through temporal intervals that resonate with the subject's innate biological constants. This allows for a shift in the focus of therapy: instead of symptomatic regulation, we propose seeking "windows of neuroplasticity"—periods of maximum system instability when a minimal polymodal intervention can lead to a systemic restructuring of experience. Although this assertion requires further extensive empirical verification, it opens the path to creating precise algorithms in preventive psychosomatology.

The formulation of the theoretical foundations of polymodal integration and the incomplete emotional wave model presents modern psychological science with a series of urgent tasks. The primary problem is the need for operationalization and objective measurement of processes that have hitherto been considered predominantly in the phenomenological realm. To implement this methodology in broad clinical practice, it is necessary to develop standardized protocols for recording somatic markers of safety

and accurately assessing the moment a prediction error occurs. This requires close interdisciplinary integration of psychology with affective neuroscience and bioinformatics to create tools that would allow tracking the dynamics of memory reconsolidation in real time without violating the ecological integrity of the therapeutic space. The current absence of such reliable metrics complicates the scaling of the approach and the training of specialists capable of safely managing windows of neuroplasticity.

In addition to methodological tasks, further research in this direction is associated with certain scientific and clinical risks. The main risk lies in the difficulty of longitudinally confirming the stability of neuroplastic changes, as the dynamic nature of an individual's life path constantly generates new stressors capable of masking or distorting the results of a previous intervention. There is also the danger of neurobiological reductionism, where an attempt to decompose complex human experience into basic predictive coding algorithms and autonomic reflexes may lead to the devaluation of the existential and semantic dimensions of psychological trauma. At the same time, clinical trials of the model require extreme caution, as the artificial induction of dissonance between a traumatic prediction and somatic reality, given insufficient qualifications of the therapist, carries the risk of massive retraumatization and the deepening of the patient's psychosomatic fixation.

Adhering to the principles of scientific rigor, it is also necessary to assume the probability that the proposed theory may not find unambiguous empirical confirmation during large-scale clinical trials. If the results of future research do not demonstrate a statistically significant advantage of polymodal integration over classical monomodal protocols, or if the mathematical forecasting of bifurcation points proves irrelevant for the majority of cases, this will have profound implications for the field. Such a negative result would not invalidate the phenomena of neuroplasticity or reconsolidation themselves; however, it would indisputably prove that the compensatory mechanisms of the human psyche are significantly more non-linear and stochastic than our model predicts. This would compel the scientific community to revise the limits of the controllability of neurobiological processes in adulthood and would stimulate the

search for entirely new, hitherto unconsidered meta-factors that moderate the course of emotional experience and determine the architecture of mental health.

Thus, in our understanding, the polymodal approach is not merely an expansion of the toolkit, but a restoration of the lost connection between time, the body, and consciousness. It is a journey from a state of psychosomatic fixation toward the formation of an adaptive self-concept, where the incomplete wave finally finds its ecological finale, transforming from a factor of illness into a resource of resilience.

Section 3

Savenkova Iryna, Ubiriia Yevheniia

THEORETICAL FOUNDATIONS OF THE STUDY OF ANXIETY DISORDERS IN CHILDREN AND ADOLESCENTS WITH AUTISM SPECTRUM DISORDER

INTRODUCTION

Research Background. In the contemporary context of psychological science, the problem of preserving the mental health of children and adolescents has acquired particular relevance, especially with regard to the study of emotional disturbances, among which anxiety disorders occupy a prominent place. The growing prevalence of anxiety in childhood and adolescence, and its adverse effects on personal development, social adaptation, and academic functioning, necessitate an in-depth scientific analysis of the phenomenon.

The problem acquires special significance in the context of autism spectrum disorders, which are characterized by impairments in social interaction, communication, and behavioral regulation. Contemporary scientific research indicates a high prevalence of anxiety disorders among children and adolescents with ASD, which substantially complicates their adaptation and integration into the social environment.

Despite the considerable body of international research, the problem of anxiety disorders in children and adolescents with ASD remains insufficiently developed in domestic science. The absence of a systematic theoretical synthesis and unified approaches to understanding the mechanisms of onset and the specific manifestations of anxiety in ASD necessitates a comprehensive theoretical investigation.

Relation to Research Programs, Plans, and Themes. The study was conducted in accordance with the directions of research work in the fields of developmental psychology, special psychology, and clinical psychology, which encompass the study of the psychological development of children with developmental disorders and the elaboration of theoretical and practical foundations for their psychological support.

Aim and Objectives of the Study. The aim of the monograph is to provide a theoretical substantiation of the characteristics of anxiety disorders in children and adolescents with autism spectrum disorder and to systematize scientific approaches to their study.

In order to achieve the stated aim, the following objectives were defined:

1.To analyze the principal theoretical approaches to the understanding of anxiety, anxiousness, and anxiety disorders.

2.To synthesize scientific conceptions regarding the psychological and neuropsychological characteristics of children and adolescents with ASD.

3.To identify the specific features of anxiety disorders in children and adolescents with ASD.

4.To analyze contemporary research on the comorbidity of anxiety disorders and ASD.

5.To substantiate the theoretical foundations for the study of anxiety in the context of autistic development.

Object and Subject of the Study. The object of study is anxiety disorders in childhood and adolescence. The subject of study is the theoretical foundations for the examination of anxiety disorders in children and adolescents with autism spectrum disorder.

Research Methods. To achieve the aim and fulfill the stated objectives, a comprehensive set of theoretical research methods was employed, including analysis, synthesis, generalization, systematization, comparison of scientific sources, and the method of theoretical modeling.

Scientific Novelty of the Findings. In this monograph:

- for the first time, a comprehensive theoretical synthesis of the problem of anxiety disorders in children and adolescents with ASD has been undertaken;
- the content and structure of the phenomenon of anxiety in the context of autistic development have been clarified;

- scientific conceptions regarding the mechanisms of formation of anxiety disorders in children and adolescents with developmental disorders have been further developed;
- contemporary theoretical approaches to the study of anxiety in ASD have been systematized.

Theoretical and Practical Significance of the Findings. The theoretical significance lies in the expansion of scientific knowledge regarding the nature of anxiety disorders in children and adolescents with ASD and in the deepening of the interdisciplinary approach to their study. The practical significance consists in the potential application of the findings by psychologists, psychotherapists, teachers, and inclusive education specialists, with the aim of improving the diagnosis and psychological support of children and adolescents with ASD.

Dissemination of research Findings. The principal propositions and findings of the study have been presented at scientific and practical conferences and seminars. And discussed at the departmental meeting Department of Clinical Psychology and Mental Health of the South Ukrainian National Pedagogical University named after K.D. Ushynsky.

Structure and Scope of the Monograph. The structure of the monograph is determined by its aim and objectives. The work consists of an introduction, chapters, chapter conclusions, general conclusions, a reference list, and appendices.

3.1. THE CONCEPTS OF ANXIETY AND ANXIETY DISORDERS IN PSYCHOLOGY AND PSYCHIATRY

3.1.1. Definitions of Anxiety, Fear, and Anxiousness

The phenomenon of anxiety has been studied by numerous domestic and international scholars, including H. Eysenck, I. Blokhina, W. James, T. Ivanova, C. Izard, Ye. Kalyuzhna, A. Kępiński, S. Maksymenko, A. Maurer, R. May, N. Miller, S. Olkhovetsky, S. Radchenko, I. Rantbut, F. Riemann, C. Spielberger, I. Striletska, D. Taylor, P. Tillich, S. Tomchuk, S. Freud, E. Fromm, K. Horney, O. Tsarkova, I.

Yastochkina, and others. Stress situations as a factor of personal anxiety were investigated by A. Auerbach, A. Waldman, A. Gal, S. Gremling, L. Grimak, J. Greenberg, T. Kobrenyuk, R. Lazarus, D. Lewis, O. Markovets, L. Naugolnyk, M. Oros, L. Pelzman, H. Selye, J. Stillman, and others. The problem of coping in adolescents with elevated anxiety levels is examined in the works of Yu. Alexandrov, I. Andrushchenko, V. Horbenko, H. Didenko, L. Karamushka, R. Lazarus, V. Pichurin, O. Serhiienko, Yu. Snihur, E. Solomka, S. Folkman, A. Khlopek, T. Khoma, Z. Shaykhlilamov, V. Shebanova, and others. An analysis of the state of research on the phenomenon of anxiety and stress situations as a factor of personal anxiety reveals considerable divergence in the interpretation of these phenomena across different conceptual frameworks.

As noted in contemporary scientific literature, anxiety is a negative emotional state associated with an anticipation of threatening danger; it is a state in which a person experiences worry and apprehension. Anxiety does not always indicate a real threat; it may arise from feelings of uncertainty or loss of control, resulting in intrusive thoughts and fear events that have not yet occurred and may not necessarily occur at all [14, p. 72-78]. It is emphasized that anxiety as a mental state arises from internal conflicts and is linked to external objects only insofar as those objects activate these internal conflicts. Anxiety is a response to an imagined, indeterminate threat, as a distinct form of fear, which is associated with specific stimuli. This state may also be prolonged, persisting over a considerable period of time, recurring, or continuous [63, pp. 479-491].

Varying levels of anxiety exist, and each individual’s level is unique, which in turn may be either beneficial or detrimental. A normal level of anxiety helps a person adapt to reality and new circumstances, whereas individuals with excessive anxiety experience difficulties in organising their activities and behaviour, are prone to perceiving threats in situations where none may exist, and consequently respond to any discomfort with pronounced tension. Optimal anxiety prompts a person to attend to a situation and potential difficulties, helping to direct efforts towards resolving obstacles and achieving the best possible outcomes. Both the complete absence of anxiety and its excess produce negative consequences: the former impedes normal adaptation,

while the latter interferes with productive activity [63, pp. 479–491]. Anxiety may vary in intensity depending on certain factors such as the strength of the nervous system, psychological resilience, the subjective perception of a situation, the level of threat, and measures taken in advance. It should be noted that the level of anxiety may increase when a person fails to resolve emerging problems in a timely manner. Therefore, at the first signs of anxiety, it is necessary to identify its causes before being compelled to deal with the consequences in the form of anxiety-laden agitation [13, 219 p.].

It should be noted that in certain situations, the manifestations of anxiety may vary. A person may display anxiety not constantly but depending on circumstances, or may behave anxiously at all times and in all settings, even in the absence of a particular cause. Depending on how an individual experiences childhood, the brain develops specific responses to various stimuli. If a child lived in a state of constant tension — in circumstances where they experienced danger, uncertainty, and fear — this may have led to a sense of groundlessness, subsequently engendering anxiety as a cognitive style [56, 200 p.]. Furthermore, the concept of "situationally stable manifestations of anxiety" indicates that a person possesses a corresponding personality trait, i.e., a predisposition to anxiety. Such an individual is capable of perceiving neutral situations as threatening and responding accordingly. The term "trait anxiety" is used to denote a stable characteristic of the personality not linked to any particular situation [74, pp. 165–170]. Separately, "situationally variable manifestations of anxiety" are characterised by subjectively experienced emotions such as worry, tension, and nervousness, arising as an emotional response to a stressful situation. Highly anxious individuals tend to perceive threats to their well-being and self-esteem across a broad range of situations [74, pp. 165–170]. Analysing the forms of anxiety, it may be observed that anxiety performs a protective function. In some instances, it has a positive effect on a person's activity, as it is accompanied by activation that can be converted into energy and motivation for action. However, this applies only to a normal level of anxiety; in other cases, anxiety may take such a powerful hold over a person that all resources are expended in experiencing this state and rehearsing negative scenarios. Elevated heart rate and other physiological reactions are also exhausting and leave no resources for resolving problematic issues [75, 20 p.].

For a long time, the concepts of "anxiety" and "anxiousness" were used synonymously. Today, researchers differentiate between these concepts. V. M. Astapov emphasises that this term denotes both a transient state of the psyche arising from stress factors and an inability to satisfy personal needs, as well as a property of the personality [8]. According to V. N. Karandashev and C. Spielberger, the term "anxiety" is used in two interrelated yet fundamentally distinct senses: it concerns the relationship of anxiety to the state of mental health and to the qualities of the individual. The first refers to an unpleasant emotional state associated with a subjective experience of tension, linked to threat, uncertainty, and danger. The second characterises an individual's disposition to perceive threats to their self and to respond with heightened anxiety [43, pp. 101–103]. Thus, "anxiety" is directly associated with a mental state, while "anxiousness" is a mental property, produced either by genetic factors or by traumatic experiences. In connection with the foregoing, anxiety is linked to the emotional dimension: it is an intense inner experience manifested in the repetition of monotonous actions and negative premonitions associated with danger. Anxiety is related to personal qualities that manifest as self-doubt and powerlessness in the face of external factors.

For a deeper understanding, let us examine the two concepts further. Anxiety, as a psychological experience, is directly connected with the needs and motivational sphere of the personality; its function is to regulate the individual's behaviour in situations of danger. It should be noted that anxiety can be caused by a variety of factors. Anxiety is usually associated with negative experiences, but its impact on the behavioral sphere of the individual has not been sufficiently studied. Two principal types of anxiety may be identified:

- Normative anxiety — mobilises all the forces and resources of the organism and serves as a call to action;

- Debilitating (disorganising) anxiety — arrests activity, leading to its subsequent disorganisation and an unwillingness to act.

Thus, anxiety may function as a stimulus for activity; however, once it exceeds the bounds of acceptable functioning, it becomes disorganising (pathological). It is

disorganizing anxiety that has negative consequences for a person [49, pp. 266–272]. Anxiety may manifest at various levels:

- physiological (accelerated heart rate and respiration, sweating, irritability, shortness of breath, etc.);
- behavioural (rocking in a chair, pacing, clenching fists, biting lips and nails, fidgeting with clothing, twirling hair, etc.);
- emotional-cognitive (feelings of helplessness, powerlessness, vulnerability, ambivalence of affect, etc.) [21].

Anxiety is either an innate trait or is formed under the influence of various situations. It is associated with the organism's neurophysiology and genetics, or determined by personal characteristics that develop over the course of one's life. Meanwhile, anxiety and anxiousness deprive the individual of the satisfaction of basic needs: emotional comfort and safety. Anxiety as a persistent state impedes clear thinking and effective communication, complicates the formation of relationships with others, and serves as a subjective indicator of personal ill-being [24, 543 p.]. Some authors (T. Ya. Reshetova, L. M. Kostina, S. A. Dmytrieva, F. Sushkova, and others) identify specific forms of anxiety, such as academic, interpersonal, and ecological anxiety [17, 448 p.]. An analysis of the literature allows one to identify the causes of anxiety at social, psychological, and psychophysiological levels. Social causes of anxiety are typically associated with impaired communication. The psychological level is predominantly linked to an individual's inadequate self-perception. Psychophysiological causes pertain to the functional characteristics of the central nervous system, including constitutional features, dyscoordination within the CNS divisions, elevated blood pressure, and pathological formations in the cerebral cortex [1, 8 p.]. Today, there is no clear answer to the question of the causes of anxiety. But it is known that unsatisfied basic human needs lead to anxiety, so a person who does not feel safe will seek it in every way. Psychologists and neuroscientists have proven that the cause of anxiety is the innate peculiarities of the nervous system, where social and psychological factors are added. The causes of anxiety include unfavorable heredity, serious illnesses, and stressful situations that contribute to the emergence of a strong fear for one's safety.

Thus, it is concluded that anxiety is, to a significant degree, directly connected to the social dimension — it is a response to unsuccessful social interaction, presented as an emotional state occasioned by the probability of the frustration of social needs.

Fear is an emotional state that elicits a protective biological response in humans and animals when they experience real or imagined danger to their health and well-being [40, 672 p.]. The experience of fear is not only expedient but also beneficial for the human being as a biological entity. However, for the human being as a social entity, fear often becomes an obstacle to achieving self-set goals. Kierkegaard distinguished two kinds of fear: unconscious fear (dread and horror) and fear occasioned by a specific object. S. Kierkegaard eliminates guilt through the experience of fear [15, 217 p.].

Research conducted in Houston, USA, demonstrated that, under the influence of examination fear (test anxiety), disturbances in the genetic apparatus occur, and the probability of oncological diseases increases. In individuals with a weak nervous system, cardiac rhythm slows, and muscle tone decreases [59]. According to K. Izard, the results of a number of studies convince us that it is necessary to distinguish between fear and anxiety, although the key emotion in anxiety is fear. [84, pp. 26–30]. Fear should not be confused with anxiety. Fear is a specific emotion that deserves to be categorized on its own. Viewing fear as a specific emotion allows us to separate it from the phenomenon of anxiety. Anxiety is a combination, or pattern, of emotions, of which fear is only one. Considering fear as a separate emotion, distinct from the phenomenon of anxiety, allows us to analyze the specific impact of fear on cognitive processes and behavioral acts, as well as the features of its interaction with other emotions. Fear consists of specific physiological changes, expressive behaviour, and a distinctive experience that arises in anticipation of threat or danger. The subjective experience of fear is horrifying, and, remarkably, it may cause a person to freeze in place, rendering them completely helpless, or, conversely, cause them to flee from danger. As a person matures, the nature of the objects that provoke fear changes: from an unconditional reflex or instinctive reaction, it becomes a conditioned reflex response linked to an awareness of the dangerous qualities of certain subjects, objects, and situations. Consequently, some fears disappear while others emerge. Some things that previously

scared a person no longer scare them; fear arises in situations whose danger was not previously recognized.

3.1.2. Normative and Pathological Anxiety

As the phenomenon of anxiety was studied, difficulties began to arise in establishing the difference between rational and pathological anxiety. The division of anxiety into "rational" and "pathological" has existed historically. Thus, the main difference between rational anxiety and pathological anxiety can be considered that the former is an expression of human helplessness in the face of real danger, while the latter, in general, is a consequence of anticipated hostility. The difference that S. Freud distinguishes is that rational anxiety is a reaction to an external threat, and neurotic anxiety is a reaction to one that prompts a demand [88]. Neurotic anxiety, according to R. May, is a reaction to a threat that, firstly, is inadequate to the objective danger, secondly, has repression (dissociation) and other manifestations of defense mechanisms, and therefore, thirdly, a person limits some of his actions with the help of various neurotic defense mechanisms. With rational anxiety, a person can constructively deal with it on a conscious level, or anxiety decreases when the objective situation changes [104]. Rational anxiety is caused by a real situation and is adequate in intensity and duration to it, while pathological anxiety is completely caused by a disease process or is excessively severe and prolonged, compared to the cause that caused it. The fundamental difference between pathological anxiety and rational anxiety is that pathological anxiety significantly disrupts the quality of a person's life and his or her activities. Many researchers adhere to this point of view. Studies of anxiety were not limited to studying the difference between rational and pathological anxiety. The focus of attention was also directed to considering the issue of the phenomenon of anxiety in various nosological forms. C. Jung believed that the cause of anxiety is the same, regardless of the nosological affiliation [100].

Some researchers have compared neurotic and psychotic anxiety through cognitive content, psychodynamic concepts that determine the clinical picture of the disease. K. Goldstein draws an analogy between the pronounced anxiety of the neurotic level and anxiety during the onset of psychosis. When a strong emotion arises, it is clear that a

person is unable to say and does not know what he is afraid of. This is especially acutely noticeable in patients with the onset of psychosis, but sometimes the same phenomenon can be observed in less extreme circumstances. A person perceives strong anxiety as the destruction of himself, "the cessation of the existence of his own personality" [90, pp. 17–39]. S. Tsirkin conducts a psychopathological differentiation of anxiety. He sees a common feature of neurotic and psychotic anxiety in the fact that, in both cases, a danger or threat is experienced. He explains the difference between types of anxiety by the source of danger, which, in the case of neurotic anxiety, usually represents something new or changed, accidental. In psychotic anxiety, the threat is diffuse, and intentionality is hidden in it. Common to neurotic and psychotic anxiety is the objectlessness of experiences [64, pp. 14–20].

3.1.3. Classifications of Anxiety Disorders (Psychological and Psychiatric Approaches)

The classification of anxiety disorders in scientific works is mainly based on ICD-10 (sections F40-F41) or DSM-5; the main types are distinguished: generalized anxiety disorder (GAD), panic disorder, specific phobias, and social anxiety disorder. They are characterized by excessive fear, comorbidity, and impaired functioning. From the point of view of the clinical and psychological approach, anxiety disorder is a psychogenically caused disease of the neurotic group. The predominant symptoms of the condition are uncontrolled experiences, irrational fear, persistent feeling of anxiety, long-term depressed mood, and tearfulness. An anxiety personality disorder can cause a desire to distance oneself from society. Unlike natural experiences due to stress, this condition is characterized by its duration. In severe cases, we can talk about anxiety-phobic mental disorders that require drug treatment. It should be noted that anxiety disorders last for at least six months and, without appropriate intervention by specialists, can lead to serious mental illnesses. Often, anxiety disorders are accompanied by physical or mental illnesses that can hide or exacerbate anxiety symptoms. Without the use of proper medical and psychological, and sometimes psychiatric care, the following consequences of anxiety disorders are observed: pathological addictions, mental disorders, suicidal tendencies, panic attacks, neuroses, paranoia, depression, anorexia, etc. [19, 310 p., 68, P.32-33]. In more detail, the clinical

signs of anxiety disorders are presented by the International Classification of Diseases, 10th revision (ICD-10). The classification includes: Panic disorder (F 41.0), manifested by panic attacks; Generalized anxiety disorder (F 41.1), characterized by constantly increased anxiety; Mixed anxiety-depressive disorder (F 41.2) – a combination of anxiety and depression. Signs of anxiety disorder are divided into physical and mental. Mental symptoms of anxiety disorder: difficulty concentrating; feeling of stiffness and tension; decreased performance; sleep disturbances, insomnia; irritability; various phobias; increased fatigue and constant fatigue; constant or periodic feelings of anxiety. Physical symptoms of anxiety disorders include: chills; nausea; tachycardia; dry mouth; general weakness; increased sweating; bladder weakness; abdominal pain; mild diarrhea; trembling or limb tremor; difficulty breathing; a sense of suffocation; headache; and dizziness. It should be noted that anxiety disorders in personality have a chronic and asthenic form, which is characterized by increased mental fatigue and periods of bipolarity, and can go through different stages: from mild manifestations to serious attacks with physical symptoms [26].

Specialists identify the following causes of anxiety disorder:

- medical conditions (hyperthyroidism, circulatory disorders, hormonal abnormalities, chronic cardiovascular pathologies, cardiac insufficiency, arrhythmia, asthma, physical exhaustion);
- use of corticosteroids and narcotic substances;
- temperamental characteristics (a tendency towards worry, distrust);
- excessive consumption of caffeine and energy drinks.

It should be emphasized that the causes of anxiety disorders are biological or psychological factors. More often, anxiety states develop precisely for psychological reasons. Among them: an anxious personality psychotype; psychological trauma; chronic stress; experienced depression or another type of mental disorder; negative psychological experience of loved ones. Biological factors can include heredity, chronic pain, or previously suffered somatic diseases. In the study of anxiety disorders, S. Stossel identified four main approaches to determining the causes of anxiety. Thus,

representatives of the psychoanalytic approach believe that the influencing factors include conscious and subconscious psychological conflicts, and that the cause of anxiety lies in the internal conflicts of the personality. From the point of view of the cognitive-behavioral model, it is believed that typical avoidant behavior is the result of long-term consolidation of an initially single fear reaction that arises due to negative life experience; The biomedical approach studies which mechanisms and structures of the brain, genetic features of the psyche increase the risk of developing anxiety, which helps to better understand how excessive anxiety is caused, as well as to look for methods of combating it. The empirical approach connects anxiety with basic existential problems, crises, and universal human values. Thus, today we cannot clearly say which of the approaches is the most effective in treating anxiety disorders [66]. Psychological diagnosis of anxiety disorder is carried out in the presence of symptoms observed in an individual for two weeks. It is based on knowledge of phenomenology and the diagnostic criteria of a typical disease. Typical manifestations of anxiety disorder are rare, so only an experienced psychiatrist or psychotherapist can recognize the problem and prescribe appropriate treatment. The detection of symptoms can be traced during a clinical interview with the patient and their relatives. During the conversation, it is important to find out how the symptoms of anxiety disorder affect the patient's daily life, how much the circle of communication has changed, and how his views on the future have changed. To diagnose an anxiety disorder, the following tests are most often used: the Beck Anxiety Inventory; the Zung test for self-assessment of anxiety and depression; the Spielberger test for determining the level of reactive and personality anxiety; the Anxiety Screening Test (GAD-7); and the Spence scale for assessing childhood anxiety. It is also recommended to use psychometric tests that help determine the severity of the disorder by measuring intellectual abilities and behavioral style, as well as to track changes in dynamics against the background of the therapy. To rule out neurological disorders, a consultation with a neurologist is recommended. When all the necessary diagnostic measures are carried out, the specialist develops a rehabilitation program, which includes psychological, psychotherapeutic, and drug support, thanks to which the treatment of anxiety disorders will be effective and comfortable for patients and their relatives. We note the importance of regular visits to

a psychiatrist, clinical psychologist, and psychotherapist for mandatory examination and prevention of anxiety after recovery. In modern psychotherapy, clinical psychology, and medicine, provisions for medical and psychological support of individuals with anxiety disorders have been developed. Its goal is to make the individual aware of the problem and create conditions for overcoming it.

To achieve the goal, we offer the following types of work: 1. Medication support (as needed, prescribed by a doctor). 2. Psychodiagnostics, psychological counseling (conducted by a psychologist). 3. Psychotherapy (conducted by a psychotherapist) [27, 328 p.]. Considering that not all patients with anxiety disorders need medication support, one of the leading means of influencing anxiety disorders is various types of psychotherapy. Effective psychotherapeutic methods with proven effectiveness are: cognitive-behavioral, body-oriented, art therapy, Gestalt therapy, and psychodynamic psychotherapy. It should be noted that in modern practice, the most widely used method is cognitive-behavioral therapy (CBT). This approach ensures the prevention of relapse and the absence of side effects, as confirmed by most modern protocols. O. I. Romanchuk notes that the CBT model of anxiety disorders, first of all, explains the mechanism of transition of normal anxiety, which is linear in nature, into an anxiety disorder, in which the anxiety reaction “loops”, and accordingly, a supporting cycle is formed, which does not lead to a decrease in anxiety, but, on the contrary, to its support. The cognitive style of many patients with anxiety disorders is characterized by typical cognitive distortions, such as “catastrophizing”, which leads to the creation of a “subjective reality”. This is because the cognitive interpretations a person makes become inadequate; that is, most life situations are interpreted as inappropriately dangerous, and the person begins to be constantly in a state of anxiety. The role of supporting cycles in understanding the mechanism of development of anxiety disorders and effective approaches to their therapy is central in CBT. [41, pp. 40 - 46.].

3.2. ADOLESCENCE AS A CRITICAL PERIOD OF PSYCHOLOGICAL DEVELOPMENT

3.2.1. Psychophysiological and Socio-Psychological Characteristics of Adolescence

The socio-psychological features of adolescence manifest in adjustment, adaptation, and socialization. In the works of Ukrainian scientists, personality adaptation is interpreted as the process of involving a person in collective activities within the framework of society, a small group or team (in particular, such approaches are reflected in the works of N. L. Kolominsky, O. E. Blynova, Y. M. Shvalb, V. V. Voloshyna, T. M. Lysyanska, I. Galetska, and other researchers). As evidenced by the analysis of A. O. Nerubasska's research, the adaptation process includes the following levels: psychological, socio-psychological, and psychophysical (biological) [28, pp. 94–98]. The author notes that psychological adaptation is manifested in the adaptation of the individual to certain conditions of the living environment and is manifested in the formation of new ideas, motives, and models of behavior, in overcoming stereotypical forms of behavior, habitual attitudes, concepts, and reflects the ability of the individual to flexibly respond to changes in the environment, applying the necessary life experience. O. M. Borysenko emphasizes that socio-psychological adaptation manifests as an individual's adjustment to a specific microsocial environment (family, class, team), involving the development of appropriate forms of behavior and interpersonal relationships that provide emotional peace and a sense of satisfaction within this environment [6].

According to the definition of D.I. Shulzhenko, psychophysical adaptation is manifested when a person finds himself in an unusual situation, which is most often unexpected or psychotraumatic in nature, and is manifested in the manifestation of new forms of behavior, attitudes, and mobilization of the body's physical forces. The formation of adaptive processes depends on the body's physical characteristics and the individual typological features of the nervous system [72]. Socio-psychological and psychophysical adaptation of the individual closely interact, reflecting the unity of a person's psychological, characterological, and psychophysiological properties. As

scientists emphasize [6, 28, pp. 94–98, 72], different levels of adaptation are components of a single process that equally affect the final result - the ability of the individual to adapt to environmental changes. According to researchers, it is important to distinguish between the final state of adaptation that arises from the interaction between the individual and the environment and the adaptation process itself, which ensures the achievement of this state. R. F. Pasichnyak [37] supports the point of view according to which the decisive role in the occurrence of ASD is played by the combination of hereditary predisposition with unfavorable conditions of the prenatal and perinatal periods. Such factors, according to the author, include genetic burden (even in the form of some behavioral traits in first-generation relatives), pathologies of labor activity, infectious or somatic diseases of the mother during pregnancy, and Rh-conflict. Analysis of modern scientific literature [5, 223 p.; 28, 39, P. 82–96.; 50, P. 284–288,.; 58. P. 332–337.; 72] indicates the presence of several variants of autism spectrum disorders: Kanner syndrome, as a classic variant of early childhood autism with relatively preserved intelligence, but a pronounced deficit in social interaction; Rett syndrome, as a specific disorder that occurs exclusively in girls, and is characterized by severe intellectual disability, stereotyped hand movements, eating problems and episodes of uncontrolled laughter; schizophrenic autism, which is characterized by disorganized behavior, paradoxical or inadequate reactions to external stimuli, specific interests, psychomotor instability, social isolation. In difficult cases, psychotic symptoms such as hallucinations or delusions may be observed. This variant is progressive in nature; organic autism, which occurs as a concomitant disorder in various organic lesions of the central nervous system. According to V. Y. Bocheliuk, the key signs of autism spectrum disorders are a triad of symptoms [5, 223 p.], which includes: autistic manifestations, which are accompanied by deep experiences, which are manifested in disorders of social contact and interaction with the environment; repetitive, stereotyped behavior with elements of obsession; atypical speech development. Analysis of the literature on this issue [6; 28, pp. 94–98; 50, pp. 284–288; 65, pp. 209–220] allowed us to generalize the forms of social contact and interaction disorders in children with ASD:

a) Avoidance of social interaction. Such children often seek solitude, show emotional indifference to people around them. Contacts are selective and are most often limited to the closest family members (for example, mother or grandmother). A symbiotic form of attachment is observed, when the child cannot tolerate even a short-term separation from the mother;

b) Children with autistic manifestations, as a rule, do not like physical contact. They do not demonstrate typical gestures or positions that would indicate readiness for contact. Their attitude towards people is monotonous and undifferentiated, regardless of who is in front of them - a familiar person or a stranger;

c) In communication, they avoid visual contact, or establish it only for a short time. Often, the gaze is directed past the interlocutor or even "through" him, which creates the impression of a lack of emotional connection. Therefore, the study of the problems of autism spectrum disorders lies in its close connection with the general socio-psychological problem of personality adaptation.

Psychophysiological and biological changes that are characteristic of the period of puberty in individuals without mental disorders also occur in adolescents with ASD. Researchers in the field of autism note that the sexual development of individuals with ASD corresponds to the sexual development of individuals without mental disorders; biological, physiological, and hormonal changes that occur during puberty in adolescents without mental retardation are also present in adolescents with autism [95, 208]. In addition, the latter demonstrate the same social interests and sexual needs as their peers [79].

According to modern ideas in sexology, psychosexual development appears as a process of the formation of sexuality, during which the following are gradually formed: sexual identity, sex-role behavior, psychosexual orientation, and sexual knowledge and ideas are acquired. There are two types of disorders of psychosexual development: first, disorders of pace and timing (delay or precocity), second, disorders that arise during the formation of the main components characteristic of each stage, respectively [33, 198 p.]. In this process of psychosexual development, the biological component has the greatest influence at the first stage - the formation of sexual identity - later, in the

formation of sexual role attitudes and sexual behavior, the role of social factors and sexual education increases [23, 280 p.].

Since communication and social interaction deficits (along with restricted and repetitive behavior) are essential characteristics of autism spectrum disorders, these disorders also affect the functioning of the sexual sphere of individuals with ASD. In particular, the inability to establish social contacts with peers and difficulties in communication can become factors that complicate the processes of forming gender identity and adequate forms of sexual behavior, and therefore can cause disorders of psychosexual development of individuals with ASD. In the work of R. M. Jones, S. Wheelwright and K. Farrell it was found that in the sample of individuals with gender identity disorders (F 64) the highest indicators according to the autism diagnostic method were obtained by individuals with a diagnosis of transsexualism, who belonged to the female biological sex, but had a male psychological sex; however, even these indicators were lower than among individuals diagnosed with ASD [99, pp. 301–306.]. However, we did not find any studies on the formation of sexual identity in individuals with ASD, both among domestic and foreign scientists.

3.2.2. Age-Related Crises and Their Relationship to the Formation of Anxiety

Age crises are a natural phenomenon that accompany a person's development throughout life. They are reflected in changes in a person's values, behavioral strategies, and emotional state. The theoretical foundations of the study of age crises are laid in the works of Sigmund Freud [89], Erik Erikson [83], and others. The importance of this issue lies in the fact that age crises affect an individual's adaptive mechanisms and their ability to function effectively in society, in professional and personal life.

The study of the main age crises, their features, and impact on the formation of the personality, as well as their significance in the process of human self-realization, remains relevant. The study of age crises is in demand in the context of psychological support of the individual at different stages of the life cycle. An age crisis is defined as a period of qualitative changes in an individual's mental development, accompanied by

internal tension and the need to adapt to new conditions [4]. Erik Erikson [83] proposed the concept of psychosocial development, identifying eight stages of the life cycle, each accompanied by a specific crisis. An important aspect is understanding that age crises are not pathological phenomena but rather natural processes of development. They serve as a mechanism for the transition to new forms of personal functioning. Baltasar's studies [78] indicate that crises contribute to adaptation and the formation of new behavioral strategies that were previously not inherent in a person. Let us consider each of the age crises in detail:

1) Children's age crises. They include the crisis of newbornhood (this period is critical for the development of the child's emotional attachment to the mother and other close people. An important aspect is the presence of a stable emotional connection between the child and his parents, which provides a sense of security and increases the further development of social and cognitive skills), the crises of one and three years (during the crisis of the 1st year, the child may show the first sign of independence, the desire to explore the world around him; the crisis of 3 years manifests itself in the form of a child's persistent desire to act "on his own", often accompanied by protest against requests and limited by adults). These crises are associated with the mastery of new forms of behavior and with awareness of one's own "I" [10]. The parenting style plays a special role that can both facilitate and complicate the passage through the crisis.

2) The crisis of adolescence. It arises in connection with intensive physiological and social changes, the formation of personal identity [42]. Important aspects are the formation of moral and ethical principles, the development of reflection, and the search for one’s own place in society. During this period, the level of anxiety and emotional instability increases, which can cause conflicts with others.

3) Youth crisis. It is characterized by the choice of a life path, professional self-determination, and the construction of interpersonal relationships [38]. A person is faced with the need to reconcile his own aspirations with social expectations. The so-called “crisis search for oneself” is often observed, manifesting as changes in professional and career orientations.

4) Midlife crisis. It manifests as a reassessment of life achievements, a need for new meanings in life, and internal dissatisfaction [78]. It is often accompanied by professional burnout, a shift in career orientation, and deep personal reflection. In the works of Lachman [102], it is noted that this crisis is often accompanied by depressive states associated with the awareness of unfulfilled life goals.

5) Crises of old age. Associated with adaptation to changes in social status (a person becomes a grandmother or grandfather; retires), deterioration of health (chronic diseases appear, the body becomes vulnerable to more viruses), and changes in life priorities [20]. At this stage, the questions of the meaning of life, analysis, and perception of past achievements, and preparation for the final stages of life become important. The level of social and emotional support from others is important, which can significantly affect the quality of a person's life during this period. It is worth noting that a person's personal characteristics play an important role in the process of experiencing such crises. Modern studies [102] indicate that the socio-cultural environment plays a significant role in a person's experience of age-related crises. For example, in families with high social support, crises can be perceived more easily and with almost no negative consequences, while in societies with high demands for self-realization, they can have a more pronounced stress-generating character. This, in turn, negatively affects the personality in a state of crisis and destroys its social ties in this environment. In addition, the features of the course of crises are influenced by indicators such as level of education, economic status, and access to psychological help. Havihurst's studies [93] show that the presence of a strategy for overcoming stress contributes to an effective exit from crisis periods. Thus, age crises are integral to personality development, contributing to its adaptation and self-realization. They play an important role in the formation of psychosocial identity, as demonstrated by the work of many researchers. They stimulate self-reflection, promote adaptation to change, and foster the development of new mental qualities of the personality, such as emotional maturity, strong-willed resilience, self-control, and self-actualization. Given their impact on the psycho-emotional state of the personality, the development of psychological support systems that would contribute to the effective overcoming of crisis periods remains relevant.

3.2.3. Adolescent Vulnerability to Anxiety Disorders

In modern theoretical and experimental research in the field of special psychology, scientific categories such as “adolescent crisis”, “personal life crisis”, “critical life situation”, and “age crisis” are frequently used. The concept of the category “crisis” includes a problem that arises in an individual's life that he cannot avoid or solve by his own efforts, using the ways and methods he knows and that are familiar from everyday past life, experience, etc. Understanding the category “personality crisis” is a phenomenological concept of a change in the “I-concept” of an individual, which manifests itself in various forms of experiences [36, 202 p.]. A life crisis arises in a situation of the impossibility of realizing a life goal, continuing a habitual existence that was characteristic and equipped. The results of scientific research by O. Andrienko, L. Bulgakova, F. Vasilyuk, O. Dontsova, and T. Tytarenko emphasize that the rapid development of the emotional and behavioral sphere occurs in adolescence. Emotional tension increases, and the “sense of adulthood” becomes the central formation within the teenager's sphere of experience. It is manifested in the desire for independence, the desire to demonstrate one’s “adulthood”, the desire to be an adult in the eyes of younger children, peers, and adults [31. 283 p], [7, 227 p.]. The psyche of adolescents with developmental disorders has its own patterns of formation and further development, which affect the overall functioning of all spheres of life. The stages of development of such a personality, in particular its entry into the “adolescent crisis”, involve the gradual involvement of the individual in various contradictory intrapersonal, interpersonal, and social relationships, accompanied by the simultaneous formation of a new holistic personality structure. In other words, in the process of crisis, a qualitatively new personal development occurs with the formation of certain social orientations of the individual in relation to himself and others. The transitional age is dangerous due to the lack of balance in the personality, as he noted, “one does not yet know how to do things in a new way, and one no longer works in the old way.” Because of this, the period of adolescence has received a number of synonymous characteristics, such as “difficult”, “crisis”, “conflict”, “transitional”, “breakable”, and many others [20, 220 p.].

Most scientists, including teachers, emphasize the hormonal restructuring of the individual's body, puberty, and changes in life priorities. But from the point of view of psychological accents, it is also worth remembering the immaturity of nervous processes, the lack of formation of the "self-image", "self-concept", increased libido, unstable self-esteem, and aggressiveness. Adolescent crisis is precisely the period against the background of which the main tendencies (positive and negative) of the personality of a teenager with developmental disorders dominate. In general, this is characteristic of all adolescents (with typical and atypical development). V. Melnychenko notes that the adolescent crisis is mainly characterized by two states: anxiety and aggression. The dominant tendencies at this age in adolescents with developmental disorders are manifestations of depression, suicidal tendencies and actions, negativism, cynicism, avoidance of responsibility, etc. [25, 117 p.]. The specificity and danger of the adolescent crisis lie in sharp changes in mood and experiences, increased excitability, impulsivity, ambivalence of feelings, etc. During this period, adolescents with developmental disorders are characterized by the phenomena of dynamic changes in the polarity of feelings, aggressive actions and verbal expressions, cruelty, lack of self-control, and violation of personal self-regulation. As D. Pagava noted, there is a term in scientific circulation that fully and clearly characterizes the crisis of adolescence - “affect of inadequacy” [36, 202 p.]. The effect of inadequacy can be considered in terms of a violation of self-esteem, which is often characteristic of adolescence. Most adolescents have a number of desires, dreams, and goals (we will use the term aspirations), but at the same time have inadequate self-esteem to achieve them. During the adolescent crisis, the main attention should be paid to changes in the emotional and motivational spheres of adolescents with developmental disorders; particular attention should be paid to the study of self-esteem and the formation of the “I-concept”. In addition, the most difficult for the adolescent himself and his environment is the change in the above-mentioned spheres, which leads to changes in behavior, ways, and methods of communicating with peers and older people. The issue of the egocentric orientation of adolescents with developmental disorders deserves special attention. This is clearly manifested in the dominant “I-personality”, when the needs, interests, desires of one’s own Ego become irresistible

[20, 220 p.]. The need to affirm one's own "I" is manifested through interest in one's own inner world and the needs of this world (whatever they may be). Violation of the aforementioned ego-dominant construct by adults or peers causes a number of reactions, such as negativism, risk-taking, suicidal ideation, scarring, theft, and the emergence of specific phenomena of adolescent behavior ("imaginary audience", "personified myth", "fictional life", etc.).

3.3. AUTISM SPECTRUM DISORDERS: CONTEMPORARY SCIENTIFIC APPROACHES

3.3.1. Evolution of Scientific Perspectives on Autism

There are many myths surrounding the diagnosis of "autism." This concept causes many contradictions. Ukrainian psychiatrists of the older generation still believe that such a diagnosis does not exist at all, and that autism itself is an intellectual disability or early schizophrenia. At the level of everyday psychology, such children are often identified with the so-called "indigo" children, or with the phenomenon of isolation and alienation characteristic of most people of our time. In 1911, the Swiss psychiatrist E. Bleuler first used the concept of the psychopathological phenomenon "autism" as a central symptom in severe disorders of interaction with reality in patients with schizophrenia. He formed this word using the Greek root "autos," which means "self," intending to emphasize the autistic escape of patients with schizophrenia into the world of their own fantasies and intolerance to any interference from the outside world. From the point of view of E. Bleuler, the concept of "autism" reflects a certain detachment of associations from experience, ignoring real relationships, protective adaptation to emotional pain, which makes it possible to avoid the demands of the environment that are unbearable for a person. From that moment on, this term began to be widely used by psychiatrists in the clinic of childhood schizophrenia, psychoses, and disorders that are based on organic lesions or underdevelopment of the central nervous system. Thus, the Austrian pediatrician and psychiatrist G. Asperger used the terminology 13 of E. Bleuler to describe autistic psychopathy while giving a lecture on child psychology at the Vienna University Hospital. A little later, in 1944, he published his second doctoral

dissertation, in which he characterized children and adolescents with a deficit in communication and social skills, as well as with limited and repetitive patterns of behavior. Among the special manifestations of the disorders studied, G. Asperger noted unnatural speech development, in which the ability to speak precedes the ability to walk; specific intonation of speech; stereotyped actions in games and hobbies; and the inability to establish full-fledged visual contact with others. Considering the essence of autism, the Austrian psychiatrist pointed to the biological disorder of affective contact and the hereditary predisposition of autistic psychopathies. By the way, later, in honor of G. Asperger, one of the varieties of autism spectrum disorders was named in honor of G. Asperger, namely the so-called high-functioning autism. Almost at the same time, in 1943, the child psychiatrist of the Johns Hopkins University Hospital, L. Kanner, in the article “Autistic Disorders of Affective Contact”, described 11 children whose behavior was exceptionally similar to the behavior described by G. Asperger in his studies. He designated the identified developmental disorders as “early childhood autism” (“infantile autism”). In his first work, L. Kanner characterized autism as a special condition with communication, speech, and motor disorders. The most common signs of early childhood autism, L. Kanner included “autistic alienation” and related social development disorders, namely: inability to adjust to adequate behavior, delay or deviation in the development of verbal and nonverbal speech, echolalia and incorrect use of pronouns, monotonous repetition of noise or words, excellent mechanical memory, limited range of spontaneous activity, self-stimulation, excessive tendency to order, fear of change and incompleteness, development of rituals, the emergence of specific hobbies and fixations on certain ideas, as well as pathological relationships with other people, and a preference for spending time with inanimate objects.

Most of the clinical features identified and characterized by L. Kanner remain part of the diagnostic criteria for autism in modern disease classifications. Although there are certain differences in the views of L. Kanner and G. Asperger, some conclusions nevertheless unite these two outstanding psychiatrists: 1) the choice of the term "autistic" reflects their common belief that children's social problems are the most important and characteristic features of this disorder; 2) in autism, the social defect is considered congenital (according to L. Kanner) or constitutional (according to G.

Asperger), and persists throughout life; 3) there are difficulties with eye contact, stereotyped words and movements, as well as a complete resistance to changes in the environment; 4) there is an external attractiveness of children with autism; 5) there is a difference from schizophrenia in three features: positive dynamics, no hallucinations and congenital developmental disorder; 6) the similarity of manifestations in some parents of children with these disorders, which is manifested in their avoidance of social life or inadaptability to it, an obsessive desire for a stable course of things, as well as the presence of unusual interests that make everything else impossible. Thus, the original definition of the term by E. Bleuler, its theoretical connection with schizophrenia, as well as the psychoanalytic theories that dominated in the middle of the twentieth century, led to the fact that autism spectrum disorders were, for a long time, attributed to the group of psychotic disorders, which were classified in the group "childhood schizophrenia". It was mistakenly believed that the basis of autistic withdrawal is the same mechanisms as in schizophrenia, that is, a certain protective avoidance of incomprehensible 15 external situations. Unfortunately, some of these utopian ideas are still supported by individual specialists. The significance of autism spectrum disorders in relation to other health problems remains underestimated by many countries and international organizations. For example, in African countries, correctional and therapeutic work with patients suffering from autism began only three decades after L. Kanner and G. Asperger published their first works. Gradually, the vector of views on autism began to change, and this phenomenon began to be considered in the context of a spectrum of disorders with a multiplicity of symptoms from mild severity to more complex forms, with Asperger syndrome also included in this spectrum of disorders. The modern definition of autism spectrum disorders as “a behavioral syndrome that has a biological basis (systemic disorders of brain development), the origin of which is explained by the interaction of genetic and environmental factors” was first proposed and substantiated in 2005 by M. Herbert [22, pp. 24–30].

In the late 50s and early 60s, the idea that autism was based on improper upbringing of children by cold and repulsive mothers was quite popular in the USA, as a result of which, in order to obtain the desired comfort, the child had no choice but to isolate

himself from all environmental factors was quite popular. In 1946, B. Rimland first introduced the concept of "neurodevelopmental disorders" into clinical practice. This was the beginning of modern ideas about the origins of pervasive (general) developmental disorders. The basic theses about autism as a neurodevelopmental disorder (brain development disorder) were set out by the author in the book "Childhood Autism: Syndrome and its Implications for the Neural Theory of Behavior". In Ukraine, the prevalence of ASD is probably unknown, since no epidemiological studies have been conducted within our country to date. However, as recent publications show, the prevalence is also increasing, and in most cases due to improved diagnostics. According to official statistics from the Ministry of Health of Ukraine (MOH), in five years — from 2009 to 2013 — the incidence of ASD increased by 194%: from 0.55 to 1.61 per 100 thousand children. This situation is due to the fact that until 2006, children were diagnosed with such diagnoses as “mental retardation” or “speech delay”, and after the introduction of the unified protocol, “childhood autism”, in some cases, without conducting a thorough differential diagnosis. From the point of view of a child neurologist, the commonly used term “childhood autism” is considered unacceptable, since it emphasizes the psychiatric nature of the disorder and does not cover etiopathogenetic factors.

The monograph “Tsunami of Childhood Autism” provides a detailed analysis of many previous studies on the etiology, pathogenesis, and features of mental development of children with autism spectrum disorders. A. P. Chuprikov, like Lorna Wing, suggests the diversity of the nature and clinic of ASD, which are united externally by a single facade of autism, and the need to involve in diagnostics both psychological tests and data from psychopathological analysis, genetic studies, electroencephalography (including EEG monitoring during night sleep), and MRI [67].

The introduction of the term “autism spectrum disorders” reflects the position of neurologists regarding ASD as a group of disorders with common clinical manifestations but diverse etiologies. Increasing evidence suggests that the development of ASD is due to genetic causes [113, pp. 228-244]. The first study of autism among twins was conducted in 1977 and found a high level of concordance among monozygotic twins. If one of the identical twins has ASD, then there is a 70-

90% probability that the other twin will also have it. For dizygotic twins, this probability ranges from 0% to 10%.

Family studies show that a child has a much higher risk of developing ASD compared to the general population if the family has a brother or sister who already suffers from this disorder [108, pp. 677-694].

Genetic causes of ASD include several groups of disorders:

— fragile X syndrome;

— monogenic syndromes (e.g., Angelman and Rett syndromes);

— chromosomal abnormalities (Down syndrome);

— microdeletions/microduplications;

— monogenic diseases: tuberous sclerosis, neurofibromatosis, epileptic encephalopathies, phenylketonuria, etc.;

— copy number variations (CNVs).

A significant number of patients with ASD have copy-number variations affecting gene clusters involved in neurodevelopment, including microdeletions/microduplications of 16p11, duplications of 15q11, and others. De novo mutations in genes involved in many fundamental brain processes, including synaptic transmission and neuronal plasticity, can lead to sporadic forms of ASD. Thus, the treatment of ASD should not be aimed at combating symptoms using so-called behavioral or psychocorrectional techniques, but at treating the underlying disease.

Perhaps in the near future, we will be able to find an answer to the question of the etiology and pathogenesis of autism spectrum disorders. Recent prospective studies have shown the presence of gene copies or single gene mutations that lead to autism spectrum disorders.

Analyzing the literature, we draw attention to the fact of uncertainty regarding the relationship between autism spectrum disorders and epileptic encephalopathies, epileptiform changes on the EEG, and prognostic prospects for treatment. Most ASD researchers have concluded that modern diagnostic criteria, especially in DSM-5, are

more extensive than the classical criteria proposed by L. Kanner. Children with ASD should be classified depending on the level of intelligence or intellectual disability.

In the Department of Child Psychoneurology of the State University “Institute of Pediatrics, Obstetrics and Gynecology named after Academician O.M. Lukyanov NAMS of Ukraine", when studying the pathogenesis, diagnosis, and treatment of epilepsy, epileptic syndromes, and epileptic encephalopathies, we noticed that among them, there are often behavioral changes, regression of speech skills, and stereotyped movements characteristic of ASD.

The particular difficulties of diagnosing epileptic encephalopathies in young children are that, in the absence of clear clinical manifestations in the form of epileptic seizures, epileptiform manifestations on the encephalogram, the main attention is paid to behavioral disorders and cognitive regression. Repeatedly in our practice, epileptic seizures in children with ASD had a hidden character for the parental eye and were mistakenly interpreted by parents as stereotypical behavior, "thinking", tantrums, tics, or night sleep disorders.

Typical are situations when the development of a child from the first months of life has an autistic (pervasive) character, and epileptic seizures join later. However, cognitive and behavioral changes that occur after the onset of epileptic seizures have been more frequently observed. This is especially true for epileptic encephalopathies (EE), in which severe seizures combined with disruptive epileptiform activity on the EEG lead to cognitive and behavioral disorders. These include, in particular, syndromes with resistant epileptic seizures, such as early myoclonic encephalopathy (Aicardi syndrome), early infantile epileptic encephalopathy (Otahara syndrome), and childhood epilepsy with migratory focal seizures, West syndrome, Lennox-Gastaut syndrome, Dravet syndrome, and epilepsy with myoclonic-astatic seizures (Duse syndrome) [85, pp. 522-530]. Nonconvulsive forms of epileptic encephalopathies are represented by the spectrum of Landau-Kleffner syndrome and syndrome of prolonged peak-wave activity during slow-wave sleep, as well as undifferentiated forms of EE with cognitive and behavioral disorders (cognitive epileptiform disintegration and autistic epileptiform regression).

In nonconvulsive forms of EE, when clinical manifestations of ASD are present, epileptic seizures may be absent or not diagnosed, and gross changes of an epileptiform nature may not be detected on the EEG. Such forms are called “epileptic encephalopathies with autism spectrum disorders and hidden or unrecognized seizures”.

When we talk about epileptiform changes on the EEG, we understand that brain structures show dysfunction, and, depending on the localization, specific symptoms arise. In most cases, neocortex dysfunction manifests, and, as mentioned above, the peak of these manifestations occurs in early childhood, usually by age 5. These manifestations should be interpreted from a neurophysiological perspective, as cortical maturation in children occurs precisely by ages 5–7. That is, it becomes clear that there is a violation of neurodevelopmental or neurophysiological maturation processes. More and more researchers are inclined to the point of view that in early childhood, ASD and epilepsy are not comorbid conditions, but processes of neurodevelopmental disorders, the ultimate cause of which must be established.

EEG examination of children with ASD, as a rule, reveals nonspecific changes on the EEG in the form of slowing or asymmetry of the rhythm, slow waves, focal spikes or sharp waves, and generalized epileptiform changes are also possible, which, as a rule, are detected during EEG monitoring of sleep and are absent during routine EEG. However, definitive diagnostic EEG criteria for epileptiform or pseudoepileptiform brain activity in children with ASD have not yet been formed, and further research is needed. Some researchers argue that epileptiform changes on the EEG are also possible in healthy children.

Based on these studies and our own data, we would like to emphasize that it is precisely in young children with neurodevelopmental disorders in the form of autism spectrum disorders that epileptiform activity may be at the root, which is not always manifested by seizures. Conducting anamnestic surveys of parents of children with ASD, we have repeatedly noticed that in most cases they note developmental disorders at the age of 12–18 months and a regressive course of the disease with the development of

intellectual and memory deficiency, which is characteristic of the epileptiform genesis of ASD [16, pp. 106-111].

3.3.2. Definition and Diagnostic Criteria for ASD

To make a diagnosis of ASD, it is necessary to conduct a comprehensive diagnostic workup to establish the appropriate diagnosis by a psychiatrist. The following methods are part of a clinical psychologist's arsenal and can be used during diagnosis.

Questionnaire for parents. Most of the necessary information about possible forms of interaction with a child can be obtained from a conversation with parents [32, 110 p., 33, 520 p.], therefore an important place in psychological diagnostics is occupied by collecting information from the words of the parents of a child who has symptoms of autism. This is the first and most important step for further work with parents and their child. The interview requires detailed information regarding family life. It is important that both parents are present at the first meeting without the child, which helps reduce the level of subjectivity in their attitudes towards the child and makes it possible to hear different views regarding the child's development and behavior in certain situations. The main directions of the conversation in this interview are presented in Appendix A. The parent questionnaire is subject to qualitative analysis of an autistic child's behavioral characteristics.

Following the diagnostic material, the CHAT Questionnaire. The CHAT (Checklist for Autism Toddlers) questionnaire was developed by Baron-Cowan and colleagues (Allen, Gillberg) in 1992 [32, 110 p., 33, 520 p., 35, 188 p.]. The questionnaire was created to monitor children's health balance. This meant that it had to be short and easy to use. The study using the CHAT questionnaire takes about 15 minutes. CHAT consists of two parts: The first part (A) covers closed questions regarding the child's functioning in nine areas. The second part (B) consists of five items, is experimental in nature, and consists of the fact that the person conducting the study evaluates the child's performance on several simple 9 tasks and allows you to compare the information received from the parents with the child's actual capabilities (see Appendix B). Both parts of the questionnaire, A and B, contain closed-ended questions and require a “yes”/“no” answer. It is worth noting that the advantage of the parent questionnaire

and the CHAT questionnaire is ease of use; these questionnaires are introductory when conducting an examination of a child with autism. The initial conversation with parents helps to reduce their tension and establish a trusting relationship. The questionnaires allow you to establish contact with parents and take the first step in establishing contact with the child. 1.4. Observation map Another, no less important step of the initial diagnosis is observation of the child.

Its implementation requires additional improvised means that need to be prepared in advance [32, 110 p.]. The method “Child Observation Map” was developed by the author’s team and consists of predefined stages (see Appendix B). We converted the observation map into a scoring scale. The components of each area were rated from 0 to 2 points, and the total score for the manifestation of the violation in each area was calculated. The function is assessed at 0 points – when the child independently performs this or that action, and/or the behavior or reaction is adequate for the child’s age; the child receives 1 point when he needs the help of an adult to perform this or that task, or the child’s behavior or reaction is not quite adequate for his or her age, but it is within the normal range; the child receives 2 points when the performance of this or that task is overwhelming for the child, or the child does not try to perform it, and the reaction or behavior is too violent or inhibited, which does not correspond to the child’s age (see Appendix B).

The 10-point observation map was tested for reliability (internal consistency of the scales). Cronbach's alpha statistic is 0.946. As is known, a child with autism very often does not follow instructions at the first meetings, so the advantage of this method is the absence of targeted instructions and only observation of the child's involuntary behavior and reactions, as well as certain areas of behavior and reactions to the proposed objects and created conditions.

Child Autism Rating Scale (CARS) The Behavioral Child Autism Rating Scale (CARS) consists of 15 items that allow diagnosing children with autism, distinguishing them from children with developmental disabilities, but without autism syndrome; it makes it possible to distinguish the degree of autism from mild-moderate to significant [32, 110 p.]. Characteristic features of the CARS scale: introduction of items that

reflect various diagnostic criteria related to the common 15 symptoms of autism as a syndrome; replacing subjective clinical observations with objective measures that allow for direct assessment during behavioral observation. The Childhood Autism Spectrum Disorders Rating Scale (CARS) contains 15 scales: relationships with people, imitation, emotional response, body ownership, use of objects, adaptation to change, visual response, auditory response, taste, smell, response to touch, their use, timidity or nervousness, verbal communication, nonverbal communication, activity level, level and degree of intellectual development, and general impression. Each scale is rated from 1 to 4 points. The total score on all scales allows you to identify the presence or absence of autism spectrum disorders, as well as determine the level of autism: 15 - 30 points indicate the absence of autism; 30 - 37 points - mild or moderate form of autism; 37 - 60 points - severe autism. Autism Spectrum Disorder Assessment Scale (CASD) The Autism Spectrum Disorders Questionnaire (CASD) includes 30 symptom questions that identify a child's behavior problems in 6 areas: • problems with social interaction; • obsessive actions (perseverations); • somatosensory disorders; • deviations in communication and development; • mood disorders; • problems with attention and understanding of danger. Each questionnaire item, if there are deviations in development, is assigned 1 point, while the child's normal development is assigned 0 points. The total number of points, according to the results of 16 surveys (15 points), determines the risk zone for autism spectrum disorder. Accordingly, the highest number of points > 15 obtained in this survey corresponds to mild, moderate, and severe autism.

ADI-R Questionnaire The ADI-R Methodology – Autism Diagnostic Interview Revised – is a structured interview given by parents/guardians about their child. It consists of 93 items, set out across 85 pages of text. The interview is aimed at identifying disorders in the following areas: behavioral aspects; language and speech; social interaction; and stereotyped behavior and narrowly focused interests. The ADI-R interview questions cover the following areas:

• Biographical data;

• Introductory questions (1);

• Early development (2-8);

• Acquisition and loss of language/other skills (9-28);

• Speech and communication (29-49);

• Social development and play (50-59);

• Favorite activities/toys (60-66);

• Interests and behaviors (67-79);

• General forms of behavior (80-87);

• Special isolated abilities (88-93);

The total time spent interviewing parents is, on average, 1.5-2 hours; 17. The questionnaire allows you to determine the child's psychological age starting at the age of 2 years old. 1. Screening diagnostic method SQR SCQ (Social Communication Questionnaire) contains:

• 40 questions in three areas:

- social interaction; - communication;

- limited, repetitive, and stereotyped patterns of behavior.

The questionnaire involves the use of 2 algorithms: 1) Survey "Throughout life" - with an emphasis on the age of 4-5 years; 2) Survey "Currently" - with an emphasis on behavior in the last 3 months. The questionnaire is usually filled out by a parent/guardian for children aged 4 and older. Determines the level of mental development of the child from 2 years old.

PEP-R Developmental Scale Profile. The Enhanced Psychoeducational Profile (PEP-R) [32, 110 p.] is a tool for assessing the development of children with autism and other developmental disorders. The results obtained from the PEP-R test are used to develop “Individualized Education Programs” (IEPs). The PEP-R is a set of behaviors and skills used to diagnose the learning styles characteristic of a particular child. The test is intended primarily for children who are at the preschool level or lower, that is, between the ages of 6 months and 7 years. If the child is older but not yet 12 years old, the PEP-

R can provide the necessary information if some of the child's developmental functions are below the level of first grade.

The Psychoeducational Profile (PEP-R) contains a developmental scale and a behavioral scale. Developmental scale. The elements of the PEP-R developmental scale are divided into seven areas of development: 1) imitation, 2) perception, 3) fine motor skills, 4) gross motor skills, 5) hand-eye coordination, 6) cognitive activity, 7) communication, and active speech. Skills in these areas are tested in 131 tasks presented in the "PEP-R Test Manual". The developmental scale scoring system includes a score of "passed" or "not passed", which indicates the unambiguous completion or failure of the task, as well as a result of "promising", which is assigned to a child who only partially understands what needs to be done in a particular task or does not have enough skills to do it well. The child may show understanding of what needs to be done, or may even complete it partially, but in a special way. Such a solution to the task is assessed as promising / "promising". Basic principles of task performance assessment: "passed" – a grade (pass) is given to a task that the child will be able to complete well on their own; "encouraging" – a grade of "encouraging" / zone of proximal development / is given to a task performance that indicates that the child more or less knows how to complete the task, but is unable to complete it successfully; or when the researcher is forced to show or teach the child several times how to complete the task; "not passed" – in a situation where the child is unable to complete any part of the task or does not even try to complete it, despite the fact that the researcher demonstrated it several times; for completing the task, the child receives a grade of "not passed".

Behavior Scale. The PEP-R Behavior Scale aims to identify atypical behaviors characteristic of autism: The 42 items of the Behavior Scale are divided into four parts: 1) establishing contact and emotional responses; 2) playing and interest in objects; 3) responding to impulses; 4) speech, language. The items of the Behavior Scale aim, for example, to identify the ability to establish eye contact, recognize inappropriate use of materials, excessive interest in smelling and tasting things, atypical use of words, or uncoordinated behavior during the task. Three new items, No. 172, 173, and 174, have been added to assess the child's response to various rewards. Behavior is rated as

"appropriate", "moderately inappropriate", and "significantly inappropriate". The items of the Behavior Scale, in contrast to the items of the Developmental Scale, relate to behavioral norms. Behavior that is neither moderately nor significantly deviant is not the norm for any age group. The results of the behavior scale can be used to monitor changes in a child's behavior. If the behavior is typical for a particular age, the child is rated "appropriate." If the behavior is quite unusual, it can be rated in two ways: "moderately inappropriate" or "significantly inappropriate." The rating "moderately inappropriate" is used when the child's behavior is moderately worse, but only slightly different from normal behavior. "Significantly inappropriate" is defined as behavior that is significantly different in intensity, quality, and frequency from normal and clearly atypical.

To display the results obtained using the PEP-R test, there is a card summarizing the study, 10 cards for noting and evaluating (rating cards), and a counting card. The 20 PEP-R test also includes cards showing the developmental and behavioral scale profiles. The developmental scale profile is the “Result” in the developmental scale (WSR), that is, it is the sum of all scored tasks of the developmental scale. After equating the developmental scale score to the age scale, the child’s developmental age can be determined. The sums of all “promising” results for each developmental area determine the child’s learning capabilities and offer starting points for planning education. The behavioral scale profile displays the sum of significantly inadequate (vs.) results in a given behavioral area, as well as the number of moderately inadequate (vs.) ratings in each behavioral area. Therefore, the PEP-R is intended, first of all, for planning an individual educational program. In the case of children with highly differentiated abilities, it will be much more useful to assess and identify areas of development in which they have achieved and those in which they have not. The PEP-R test presents a profile of the child's developmental level, determined relative to the normal population, in a form that approximates the developmental age. The child's achievements in each area of activity can be compared with those in other areas of development. It is worth noting that specific methods designed specifically for children with autism are: a questionnaire for parents, an observation card, a CHAT

questionnaire, a scale for assessing the manifestations of autism (CARS), and a profile of the PEP-R developmental scale.

The features of the examination of children with developmental disorders, as well as children with autism in particular, are given in the works of foreign and Ukrainian scientists: E. Brodovich, L. Grechko, M. Ilyina, I. Mamaychuk, I. Martsynkovsky, K. Ostrovskaya, O. Romanchuk, V. Synyov, T. Skrypnyk, M. Skorchynska, V. Tarasun, G. Khvorova, L. Shipitsyna, D. Shulzhenko, etc.) [11, 20 p.; 22; 32, 110 p.; 33, 520 p.; 35, 188 p.; 44, 238 p.; 44, 238 p.; 46, P. 175–180. ; 45, 186 p. ; 51, pp. 25–30., 53, 234 p.; 60, pp. 247– 258.; 70, 386 p.]. During the psychological examination of children with autism, we rely on the following provisions: diagnosis should be early; psychological examination is carried out at the request or consent of the parents; the scheme and selection of diagnostic and psychocorrectional methods should correspond to the nosology of the child's disease, the peculiarities of its age characteristics, the specificity of its leading activity, characteristic of each age period; provided that problems that are within the competence of another specialist (doctor, speech therapist) are clarified, the psychologist helps to establish contact between parents and relevant specialists; diagnostics is carried out not only of the child's weaknesses, but also of his strengths; verification of the obtained data should be confirmed by additional methods.

Based on the data obtained from the primary and in-depth diagnostics, the psychologist determines the child's developmental profile and highlights the examination results in relation to the child's psychological characteristics. The psychological characteristic contains information about the characteristics of the child's behavior during the examination, the level of the child's mental development, the determination of the level of development of individual mental functions, the degree of severity of certain psychological disorders in the areas of the psyche characteristic of autism, and the level of manifestation of autistic disorders is also indicated. The characteristics of the child's strengths and recommendations for further work with the child are also provided. The next step is to submit the results of the child's examination for a joint discussion by specialists in the features of the child's mental development, where they determine possible options for correctional and developmental work; predict the effectiveness of using a particular technique, and develop an individual correctional development

program. The final stage of the diagnosis is a meeting of specialists, in particular a psychologist, with the child's parents, during which they present the results of the child's psychological examination in the form of a psychological characteristic and provide recommendations for the child's further development. Together with the parents, short- and long-term goals for working with the child are determined, as well as joint decision-making by specialists and parents regarding the child's further educational path and decision-making on the implementation of an individual correctional development program.

3.3.3. Clinical and Psychological Characteristics of Adolescents with ASD

Analysis of psychological and pedagogical literature shows that adolescence is one of the most important stages of a person’s life. It contains many sources and beginnings of the entire further development of the personality. This age is unstable, vulnerable, and difficult, and it turns out that it depends more than other periods of life on the realities of the environment. In adolescence, the loss of childish status occurs, although unrealistic ideas about one’s own privileges and adult status persist. This situation is also facilitated by subjective impressions: sharp physical changes, dreams and ideals that begin to seem less real, crises that clash with oneself and one's family, feelings of loneliness, and the desire to quickly achieve the status of an adult. O. Skrypchenko notes that the main neoplasm of adolescence is considered to be the feeling of adulthood, which is realized in the child’s desire to be recognized by the immediate environment as an adult independent person [9, 416 p.].

Adolescence is characterized by emotional instability. Adolescents are characterized by mild excitability, mood swings, and experiences. During this period, activity increases, value orientations change under the influence of the desire to be an adult, and the desire for independence intensifies. This desire manifests a sense of one's own adulthood and the need for it to be recognized by others. Self-esteem is no less important than adults' self-evaluation. The standards of interpersonal perception that adolescents use when evaluating others become more generalized and correlate with ideals, values, and norms [71]. Self-esteem becomes an important factor in the

psychological development of an adolescent, serving as a regulator and motivator of behavior. In adolescence, a conflict may arise between self-esteem and the adolescent's own aspirations if he is unable to achieve them. In such cases, resentment, distrust, aggressiveness, and misunderstanding with peers arise [30, pp. 171-174].

Let's start with the characteristics of changes in the physical development of adolescents with autistic disorders. Studies show that such adolescents enter puberty later, usually lag behind in height, weight, and hormonal development. Sometimes, at this age, endocrine pathology is first diagnosed. Some researchers have observed the emergence of serious nervous system disorders. Approximately 25-30% of children with autism first have epileptic seizures between 11 and 14 years of age. On the other hand, at this age, scientists observe a decrease in the excitement and impulsivity characteristic of the early development of autistic children [3, p. 149-155]. These features are replaced by inertia, passivity, and chronic lack of movement. Parents complain about the great passivity of children, their desire to lie down or sit more, their lack of desire to do anything, and their reluctance to leave the house.

Now, let's move on to the consideration of emotional changes. Adolescence, from the perspective of emotional experiences, is a special turning point in development for all children. At this time, positive trends and certain difficulties of emotional adaptation to new experiences are determined. But the experience of families with an autistic child, as well as research data, shows [3, P.149-155] that both the achievements and difficulties of an autistic teenager have their own characteristics. Adolescents with special needs are characterized by a certain, sometimes very significant, delay in emotional and personal development, asynchrony of the development of the psyche as a whole [45,186 p.]. Very often, significant difficulties arise in relationships with loved ones, behavioral problems, pathological urges, emotional imbalance, and even affective breakdowns often arise or intensify. However, aggression or auto-aggression, which is characteristic of an earlier period, occurs much less frequently, but can be much more emotional, violent, and dangerous than it was before. A special emotional conflict in the development of adolescents with autism is added by the discrepancy between their desire to communicate with peers and their very low actual communication capabilities. At the same time, in the teenage company, there are often

comrades who begin to tease their peers with autism, provoking them to inadequate actions. The social situation of development is changing dramatically: an orientation towards the environment of peers begins to prevail, the desire for one's own life, separate from the life of parents, grows, and awareness of oneself as a separate subject grows. At the same time, environmental demands on the growing teenager increase. Summing up the features of emotional restructuring, we note that the most important feature of the work on providing assistance in the social and everyday adaptation of adolescents with autism is the need for a predominance of positive emotions and positive emotional support for the slightest movement forward. The success of achieving the main goal depends on the positive emotional coloring.

3.4. ANXIETY DISORDERS IN ADOLESCENTS WITH ASD: MANIFESTATION PATTERNS AND PREVALENCE

3.4.1. Types of Anxiety Disorders Characteristic of Adolescents with ASD

Over the past decades, specialists from various fields have been paying increasing attention to autism spectrum disorders (ASD). The significance of this problem is explained both by the growth of research in the field of clinical practice with children with ASD, and by the lack of practical knowledge in the field of therapy and psychological and pedagogical correction. In this regard, the problem of teaching, upbringing, and development of children with ASD has become relevant both in the education system of Ukraine and throughout the world. As our theoretical analysis of literary sources on the problem under study has shown, quite a few works are devoted to the adaptation of children with ASD to a full life in the social environment, society, which is impossible without the proper level of development of their social and communicative skills, the ability to interact with others (N. V. Bazym, K. O. Ostrovska, G. M. Khvorova, M. K. Sheremet, D. I. Shulzhenko, etc.). Therefore, taking into account the above-mentioned scientific selection of domestic authors, it is worth noting that the most characteristic signs of speech activity disorders in autism spectrum disorders are: impaired contact and selective contact; unstable interest in interaction; decreased desire to declare oneself, initiate communication; selective reaction to

address, to one's own name; inability to conduct a dialogue; features of speech development: mutism, the presence of echolalia, a large number of cliché words and cliché phrases, phonographic nature of speech (reproduction of poetic fragments, songs with their incomplete understanding or its complete absence) and its autonomy, insufficient lexical stock and limited understanding and adherence to lexicogrammatical norms of the native language; late appearance in speech and incorrect use of personal pronouns; literal perception of the meaning of words, difficulties in interpretation; widespread use of neologisms; disorders of the prosodic components of speech (deviations in tone, speed, rhythm, intonation), disorders of logic, completeness and sequence of coherent utterance, etc. [2, 20 p.; 60, p. 4-8.; 69, 192 p.; 71, 122]. As we can see, the spectrum of speech and communication disorders in ASD is very wide, however, whether a person with autism uses speech or not, the most characteristic are disorders of its social aspect. Also significant is the fact that the pragmatic component of speech is most impaired compared to semantics or syntax. In this regard, addressing the problem of developing communication skills in children, in particular with autism spectrum disorders, it is necessary to note that the formation and use of communication skills is a complex process that begins at an early age and affects the development of many other functions of the child and is the key to the successful acquisition of academic knowledge later, the ability to respond to society, and interact with the environment. Therefore, in order to facilitate the entry of children with ASD into social life and reduce the occurrence of anxiety disorders, it is necessary to develop their social skills, which will contribute to the establishment of communication between these children and the people around them. A positive environment and support from teachers and peers can significantly facilitate the process of social adaptation of children with ASD. Creating opportunities for active participation in joint activities and interaction with others will help minimize negative manifestations of their development and form adequate self-esteem, which will increase self-confidence and one's own abilities. Thus, revealing the features of the communicative activity of children with autism, we are inclined to conclude that the specifics of the development of children with ASD lead to significant difficulties in acquiring communicative and speech skills.

Autism is also considered to be a social developmental disorder characterized by one or more specific deficits in understanding and participating in social interactions. Current medical and psychological theories suggest that this disorder involves a complex set of atypical processes, particularly in the forms of cognition of reality: perception, attention, and motor development. Studies of these processes have shown that adolescents with ASD exhibit important neurological differences. These impairments are associated with relative dominance in some aspects and weaknesses in others. Autism is increasingly conceptualized and even diagnosed in terms of the development of sensory, motor, and attentional functions. For example, in the area of attention, there is a weak or absent focus on objects of joint fixation (i.e., weak joint attention) and atypical behavior in terms of focusing on the interlocutor during social activities in the usual environment. These aspects have become key characteristics of diagnostic tools based on direct observation of adolescents with ASD. A child with an autistic type of development often has an obsessive desire for physical contact and has the following manifestations of tactile stimulation: hitting his ears with his hands, biting and pressing his lips, bending and unbending his fingers, and fingering them; shaking, waving and rotating his fists; walking and running on tiptoe; spinning around himself [33, p. 37]. Direct correlations of the degree of autism with the factor “sensory integration disorders in autistic children” indicate that with a high degree of autism, there is a low level of development of manual abilities, graphomotor skills, significant disorders of sensory integration, namely manifestations of specific tactile sensitivity, when the child shows an inappropriate reaction to touch, which is associated with manifestations of aggressive and auto-aggressive behavior, and also increases the risk of anxiety disorders [34, p. 33]. Features of sensory, motor activity and attention are directly related to the degree of autism of a particular child. Features of perception and difference have now become part of the diagnosis of autism, since “unusual sensory behaviors” were included in the fifth edition (DSM-5) of the “Diagnostic and Statistical Manual of Mental Disorders”, which is a reference manual for the classification and diagnosis of autism. According to the International Classification of Diseases (ICD-10), forms of autism are listed under codes F84.0–F84.9. The Classifier of Diseases and Related Health Problems NK 025:2021 of the Ministry of Health of Ukraine for

2021 classifies childhood autism with code F84.0 in section F84 (pervasive mental developmental disorders) [18, p. 257]. The importance of atypical motor development in the autistic phenotype has long been recognized in almost all diagnostic systems, in particular due to the presence of repetitive movements. The first and most noticeable aspect of autism is a significant decrease in spontaneous attention to voices and faces and increased attention to non-social aspects. Such behavioral responses are central to social models of autism and to general models of autism, which include atypical attention and perception processes. This aspect of autism may also suggest that the sequence of processes by which a person detects, recognizes, stores, and mentally processes representations of social information is unique and intrinsically different from the norm in people with autism. Coordinated social interaction presupposes a certain common set of perceptions and meanings, and this is lacking in the communication of adolescents with ASD with normotypical people [47, p. 47].

Anxiety disorders in autism are complex in nature, including the following factors. Neurobiological mechanisms. Adolescents with ASD have been found to have dysfunction of limbic structures (amygdala) and anterior cingulate cortex, which is associated with increased reactivity to stressful stimuli and the formation of generalized anxiety [116, P. 302-317]. Genetic predisposition. Polymorphisms of genes responsible for the regulation of the serotonin system (SLC6A4) and dopamine receptors (DRD4) increase vulnerability to anxiety disorders in individuals with ASD [109]. Sensory hypersensitivity. Excessive sensory sensitivity leads to chronic stress and avoidant behavior, which increases anxiety reactions [105, P.1093-1101].

Psychosocial factors. Social isolation, bullying at school, and misunderstanding by peers contribute to the development of anxiety [57, pp. 37-40.; 48, pp. 80]. There are certain differences in anxiety disorders in adolescents with autism and normotypical peers: verbalization of emotions. Adolescents with ASD are more often unable to clearly describe internal experiences, which complicates the clinical assessment of anxiety [101, pp. 38-48]. - specific phobias. Fear of disruption of routine, sensory overload, or unfamiliar objects is typical of ASD and differs from social or generalized phobias of normotypical adolescents [12, pp. 48-54.]. - somatic manifestations. Headaches, abdominal pain, and sleep disturbances often mask anxiety states in ASD

[12, pp. 48-54.]. When diagnosing anxiety disorders in children with autism, it is important to pay attention to the differentiation of symptoms of autism and anxiety disorders. Difficulties in diagnosis are associated with the fact that some manifestations of anxiety can be mistaken for the main symptoms of autism and vice versa. The situation is complicated by the fact that among the psychodiagnostic tools valid in Ukraine, there are no methods for measuring the level and manifestations of anxiety that take into account the specifics of autistic children. The most specific tool for ASD is the Anxiety Scale for Children with Autism Spectrum Disorder (ASC ASD), developed in 2016 by a group of scientists [110, P. 1205-1215.]. This scale takes into account the sensory, social and ritual components of anxiety characteristic of ASD, but, unfortunately, it is not available to Ukrainian specialists (not translated and not adapted for Ukrainians).

It is advisable to take a comprehensive approach when studying the features of anxiety disorders in children with autism. Interviewing the adolescent, his parents and teachers in combination with clinical observation, assessment of behavioral changes in different environments provides a more accurate diagnosis [110, P. 1205-1215; 33, p. 10]. It is also important to clearly distinguish stereotypes and ritual behavioral patterns of ASD from obsessive-compulsive symptoms of generalized anxiety [116, P. 302-317.]. Researchers note some correlations between the level of anxiety in adolescents with ASD and other factors. In particular, adolescents with ASD without intellectual disabilities have a higher prevalence of anxiety disorders [119, P. 160-167]. - concomitant psychopathology. The most common anxiety disorders:

Generalized anxiety disorder - characterized by increased anxiety, even without real reasons for stress. Typical symptoms:

• constant feeling of nervousness, anxiety;

• rapid fatigue;

• problems with concentration;

• irritability, excessive irritability;

• headache, joint pain, digestive problems, heart complaints;

• sleep disturbances, difficulty falling asleep, or sleep is too sensitive;

• long-term course, people suffer for months and years.

In children, ADHD (attention deficit hyperactivity disorder) can manifest itself in a similar way.

Panic disorder - unlike generalized, which has the character of a kind of background anxiety, panic disorder is paroxysmal. Against the background of seemingly psycho-emotional well-being, a panic attack develops acutely, suddenly:

• heart rate increases, heart beats up to 130 beats per minute;

• sweating;

• chest pain;

• feeling of incomplete breathing;

• trembling in the body;

• dizziness;

• fear of death.

Such an anxiety attack can occur at any time of the day or night, sometimes several times a day. The attack lasts minutes, which for the patient himself seem like hours.

Social anxiety disorder - fear that arises during communication with other people. It is haunted by a feeling of condemnation by others, fear of receiving a negative assessment from society, the collective. The problem manifests itself when a person gets into a group of people or needs to contact society:

• autonomic disorders (sweating, flushing, trembling of the limbs, head, torso);

• rapid heartbeat;

• abdominal pain, irresistible (imperative) urges to go to the toilet;

• nausea, vomiting;

• difficulty looking other people in the eye, head down;

• muffled voice.

Such patients strive to remain unnoticed, avoid leadership, friendly and professional relationships. Accordingly, teamwork suffers.

Sometimes children with this disorder have selective mutism - muteness, inability to speak in certain situations.

Simple phobias - such disorders are considered irrational fears. That is, a person experiences uncontrollable fear of, in principle, innocent things and processes:

• in children - fear of the dark;

• agoraphobia (fear of open spaces);

• claustrophobia (panic in confined spaces);

• fear of heights, flying, the sight of blood, animals, spiders, etc.

Obsessive-compulsive disorder (OCD) is a chronic mental condition characterized by intrusive anxious thoughts (obsessions) and repetitive actions/rituals (compulsions) that a person performs to relieve anxiety.

Comorbidity with obsessive-compulsive disorder, depression, and ADHD increases the severity of anxiety symptoms [116, P. 302-317]. High levels of anxiety in parents correlate with higher anxiety scores in adolescents with ASD [117, P. 62]. Effective help for adolescents with autism and anxiety disorders should be based on an integrated approach.

- Cognitive behavioral therapy (CBT). Adapted CBT modules demonstrate significant reductions in anxiety in adolescents with ASD [109, p. 240].

- Sensory integration. SI programs reduce physiological arousal and increase the ability to self-regulate [111, P. 1493-1506].

- Parent education. Seminars and trainings help parents create a supportive environment and adjust behavioral interventions [57, P.37-40].

- Drug support. Selective serotonin reuptake inhibitors can be used for severe generalized anxiety as prescribed by a psychiatrist [82, P.1102- 1124]. The

pathogenesis of anxiety disorders in adolescents with autism is multifactorial and includes neurobiological, genetic and psychosocial components. Specific features of manifestations (sensory phobias, rituals, verbalization) require adapted diagnostic tools in the Ukrainian psychological space, such as ASC ASD. Comprehensive therapy programs that combine CBT, sensory integration and family training are the most promising for reducing anxiety levels and improving social adaptation of adolescents with ASD.

3.4.2. Specific Features of Anxiety Manifestations in Autism: Biological, Psychological, and Socio-Environmental Factors

In scientific works, ASD is considered as a result of the interaction of genetic and environmental factors [106, P.1-9]. Factors that increase the risk of pervasive development during the period of conception include: 1) the presence of cases of ASD, speech development disorders, severe mental disorders (schizophrenia, bipolar disorder) in the family history; 2) late (over 30 years) age of the mother and/or father at the time of conception; 3) conception of the child by in vitro fertilization. Late age of the parents has a greater effect on the risk of developing ASD than late age of the mothers. There is no evidence that late age of the mother, and not associated disorders of pregnancy and pathology of childbirth, increase the risk of pervasive development. Taking antidepressants by women during the year before conception is accompanied by a 2-fold, valproic acid salts - a 4-fold increase in the risk of ASD. In vitro fertilization increased the risk of ASD by 7 times. There is no direct evidence that in vitro fertilization, rather than advanced maternal age, is the cause of the higher incidence of ASD.

A number of harmful factors acting during pregnancy and childbirth are also associated with neurodevelopmental disorders. All known teratogens cause congenital malformations, affecting embryogenesis during the first eight weeks after fertilization. Later harmful factors have a greater impact on the severity of pervasive disorders than on the likelihood of their occurrence. An increased risk of ASD has been proven in the presence of one or more adverse factors in the obstetric history - low birth weight (<

2500 g), low Apgar score at 5 min (< 6 or < 7), gestational age at birth < 37 weeks, obstetric operations in the obstetric history. Various developmental defects during pregnancy increase the risk of pervasive developmental disorders equally; the risks of different factors are not additive. Smoking during pregnancy increases the risk of ASD by 2.6 times. A higher probability of ASD diagnosis correlates with maternal hospitalization in the first trimester of pregnancy due to a viral infection, and in the second trimester - with a bacterial infection. Taking antibacterial and antiviral drugs during pregnancy increases the risk of autism by 4 times. A twofold increase in the risk of ASD in children of mothers who used selective serotonin reuptake inhibitors (SSRIs) during the year before delivery has been established, and a threefold increase in the risk when taking SSRIs in the first trimester of pregnancy.

Five environmental factors have been identified - mercury, cadmium, nickel, trichloroethylene and vinyl chloride, increased exposure to which is associated with ASD. Three other environmental risk factors—residing in regions that are urbanized, located at higher latitudes, or regions with high annual rainfall—may be associated with insufficient solar insolation and the development of vitamin D deficiency. Vitamin D plays an important role in repairing DNA damage and protecting the genome from oxidative stress, which is a major cause of its damage. Factors associated with vitamin D deficiency are likely to contribute to an increased frequency of new mutations and to hinder gene regeneration [46].

However, as already noted, regardless of the state of the autistic disorder, the main diagnostic criteria for autism are triads of behavioral disorders [23]. These are:

-disorders in the sphere of social relations and social regulation (difficulties in using various forms of non-verbal behavior - eye contact, facial expressions, posture, and gesture);

-disorders in the communicative sphere (stereotypic, absence or delay of expressive speech and significant disorders of impressive speech; non-use of non-verbal means of speech, lack of need for collective play activities);

-limited patterns of behavior, interests, and types of activities (repetitive repertoire of behavior - ritualism, monotony, "fixation", limitation, constancy of interest in certain

objects or details). At the same time, the central symptom of this triadic disorder is recognized as a socio-emotional disorder. In particular:

- a deeply autistic child in the sphere of socio-emotional interaction does not strive for social communication at all;

- with moderate damage - strives for interaction only for the sake of the ultimate goal (desired object);

- with a mild form of autism - shows significant difficulties in recognizing the needs of another person.

At the same time, it is necessary to direct diagnostic efforts to identify the causes of these behavioral deviations in an autistic child. Over the past decades, intensive searches have been carried out abroad and in our country in the fields of medicine, psychology, and neuropsychology for the causes of these psychophysical and socio-emotional disorders in children. According to the above, groups of disorders of neuropsychological systems in children with autism have been identified. Let us briefly reveal the essence and meaning of each group:

The first group of disorders concerns the insufficient formation of the programming and control function. This function includes the following mental operations: planning, working memory, processing information stored in short-term memory, switching from one set of representations to another, and inhibiting certain reactions. It has been proven that sufficient development of the programming and control functions contributes to an increase in the child's ability to participate in social interaction, which requires him to promptly assess and choose appropriate responses to constantly changing information. In this regard, the conclusion of neuropsychological studies [51, pp. 25–30] that it is precisely the violation of the programming and control function that causes disorders in understanding the experiences of another person by a child with autism and explaining the behavior of others to himself based on an assessment of their mental state is important. Serious deviations in the socio-emotional sphere in autism, from this point of view, arise as a result of a separate violation and are partial in nature in the form of a decrease in the ability to socialize. Accordingly, the low ability of an autistic person to understand the experiences of other people is a reflection of a broader

violation of the processes of programming and control, which penetrates all areas of the child's life and may underlie the pronounced social maladaptation characteristic of autism.

The second group of disorders characterizes the features of the formation of the functions of sequential and holistic information processing (according to the theory of weakening of central binding). According to the results of autological studies, it was established that children with autism are characterized by sufficient formation of different levels of sequential (and not formation of holistic) information processing. In this regard, studying the causes of underdevelopment of sequential-holistic information processing in children with autism will contribute to the identification of sufficiently mature functions in them, as well as the identification of underdeveloped and impaired functions. Ultimately, the implementation of such an approach will contribute not only to the study of the causes of underdevelopment of the socio-emotional sphere of a child with autism, but also to the further identification of ways to prevent the emergence of significant difficulties in mastering various types of activities.

The third group of disorders characterizes the features of the deficit in the reproduction (representation) of the functions of internal representations in a child with autism, based on what is seen, heard, and felt (according to the limbic theory and the theory of weakening of central binding). The limbic theory is a combination of several theories (biological, neuropsychological, and behavioral), which emphasize the special connection between the limbic system and autism [52, 580 p.].

In neuropsychological studies, the limbic area of the brain is of particular interest because it is closely related to a person's socio-emotional functions. It is the limbic system that allows a child to establish social connections, form complex emotions with a social component (anger, sadness, joy), understand them, and subsequently distinguish such subtle feelings as love, altruism, empathy, and happiness. At the same time, the limbic system integrates sensory and motor systems with emotional responses. In addition, the limbic system, by providing a synthesis of motor-sensory circuits of emotions and memory, contributes to the formation of imagination, which A. Einstein considered more important than knowledge, since "knowledge speaks of

everything that is, and imagination speaks of everything that will be". Studies of the causes of limbic system disorders in children with autism prove that the key role in early autistic manifestations of social and emotional behavior disorders (passivity, lack of initiative in the process of interaction with other people, weakening of eye contact, impoverishment of facial and bodily expression, etc.) is played by disorders of the limbic system. Internal psychological factors include individual psychological characteristics that indicate vulnerability under distress, which determine a person's perception and attitude toward unforeseen situations and influence the formation of stable psychological reactions to stress. Large individual differences in the perception of a threat are revealed. Many people cope well with the threat, while others experience high levels of distress or exacerbation of pre-existing psychological problems, such as anxiety disorders and other clinical conditions [52, pp. 5-27, pp. 510-560].

Anxiety in adolescents with ASD is a universal emotion that arises in response to threatening stimuli with a clear functional purpose to get out of a threatening situation. At the same time, anxiety disorders are characterized by excessive, inappropriate worries. These disorders are characterized by a chronic course if not treated. Anxiety disorders are associated with significant distress and interference with daily functioning [Ivanova T. Anxiety as a psychological phenomenon. Bulletin of Lviv University. Series: Psychological Sciences. 2020. Issue 6. P. 72–78., p. 74]. The prevalence of anxiety disorders (42%) in the population of people with ASD is approximately 2-4 times higher than in the general population (10-20%) [97, p. 559-572]. Anxiety can be a debilitating disorder for people with autism spectrum disorders, potentially affecting people in all life contexts. Anxiety in children also has a marked impact on family functioning to a greater extent than in other social settings [73, pp. 83–86]. In addition, anxiety can exacerbate the underlying difficulties of people with ASD, increasing social inadequacy, repetitive questions, and ritualistic behaviors [29, pp. 174–193]. A significant positive association has been found between restricted repetitive behaviors and anxiety symptoms in young people with ASD. Anxiety can make it difficult to interpret social cues, which can eventually discourage attempts at communication. Social communication problems can act as associated stressors that trigger anxiety in people with ASD. Thus, anxiety symptoms and social interaction

deficits are mutually reinforcing and condition each other. The functional characteristics of people with autism spectrum disorders, such as a tendency to obsess, a lack of generalization of concepts, and alexithymia, contribute to the maintenance of anxiety disorders. In the long term, the presence of anxiety symptoms threatens with limited social support, difficulties in school, and underemployment [90, pp. 247–262]. Given the significant comorbidity of anxiety disorders with autism spectrum disorders, this problem is particularly acute in view of the need to promote optimal functioning of these people in society.

3.4.3. Comorbidity of Anxiety Disorders and ASD

Comorbidity in psychiatry is the presence of one or more diseases in addition to the primary disease, or the effect of such an additional disease. A comorbid disease or disorder can be caused by or directly related to the primary disease [67, 184 p.].

One of the most common issues studied in the mental health of children and adolescents is the symptoms that are characteristic of ADHD and ASD. This is the most common comorbid combination that leads to anxiety disorders in children and adolescents with ASD. The main symptoms of these conditions significantly impact the child's development. These include social, emotional, and cognitive functioning. The presence of such symptoms affects the progression of mental disorders and the dysfunction of the child or young person, their peer group, and their family. Secondary symptoms of ADHD and ASD can be extremely harmful. Such children are often subjected to prolonged negative feedback on their behavior and face unfavorable educational and social circumstances. It should be noted that such disorders are mostly persistent and persist into adulthood.

Studies of school-age children have shown significant phenotypic associations between the features characterizing autism and those characterizing ADHD [94, pp. 369–379]. In addition, clinical studies have shown high comorbidity between ASD and general psychopathology. In 70–96% of cases, the diagnosis of ASD is complicated by at least one comorbid disorder [103, pp. 702–710]. ADHD symptoms and motor disorders have been shown to increase the severity of autism in the context of an inherited familial

predisposition to autism [94, pp. 369–379]. Studies have found that from 40% to 80% of children with autism experience sleep problems - delayed sleep onset, nighttime awakenings, parasomnias, sleep-disordered breathing, and daytime sleepiness. In addition, children with co-occurring ADHD symptoms and autistic features are 5 times more likely to develop sleep problems (odds ratios ranging from 2.10 (taking time to become alert in the morning) to 3.46 (excessive body movements during sleep)) [114, pp. 214–221]. Given that variation in autistic traits in the general population is related to the genetic causes of autism itself, characterizing the early developmental period of associations between autism and psychiatric features is important. These include manifestations of well-documented trait overlap (in typically developing populations), comorbidity with autism (in clinical populations), and factors that modulate enduring features of social-behavioral adaptation across children. The superimposition of independently inherited psychopathological traits on a critical level of susceptibility to autistic traits may actually contribute to the causal development of autism itself as a categorical clinical condition, especially in cases where symptomatic features of shared (comorbid) liability remain prominent throughout later development. Clinical comorbidity of specific psychiatric syndromes with autism may arise through the interaction between susceptibility to autism and independent susceptibility to other psychopathological traits. This suggests opportunities to preventively improve the outcomes of these interactions in childhood, perhaps by intervening to address developmentally independent behavioral traits that change (e.g., emotional dysregulation or attention problems) that may exacerbate the severity of autism and ADHD during development [94, pp. 369–379]. ADHD and ASD are characterized by a number of developmental abnormalities in childhood. All abnormalities indicate that the disorders are characterized by difficulties that may be distressing to caregivers and other close people, as well as to the child. Adolescents with ADHD and ASD differ from their peers in a number of developmental characteristics [94, pp. 369–379]. A thematic overlap has been found in difficulties interacting with and understanding peers, indicating impaired social functioning [77, p. 34]. The fact that language problems are indicative of both disorders is not surprising, since language deficits are common in ADHD and communication difficulties are part of the diagnostic criteria

for ASD [96]. The analysis showed that the dually affected group (ADHD + ASD) showed both the most frequent and the most pronounced signs of developmental abnormalities. Young people with ADHD and ASD have been shown to have greater impairments and more difficulties with executive function than those with ADHD or ASD alone [77]. Children with autism experience limitations in their participation in life activities. One factor that may contribute to their reduced participation is anxiety, which is more common among young children with autism than among their neurotypical peers. Anxiety is also closely associated with sensory overreaction and has a significant impact on daily functioning [112].

Individuals with ASD demonstrate a range of intellectual and language functions [120, P. 146]. Many features have been associated with atypical behavior in peer interactions (tendencies not to join in with others in play and aggressive and anxious social behavior). Problems with attention, hyperactivity, and impulsivity have also been associated with ASD, as have several features indicating internalizing symptoms such as anxiety, worry, and phobias. In ADHD, features related to difficulties in paying attention, impulsivity, and hyperactivity have been present since the age of 3. Language problems and problems with anger and anxiety have been identified by the age of 9. Researchers have identified the following risk factors and phenotypic manifestations of ADHD and ASD: – many copy number variants and chromosomal abnormalities pose risks for ADHD and ASD. Genome-wide association studies of five major psychiatric disorders, including ADHD and ASD, have revealed evidence of shared genetic risk factors between ADHD and ASD, as well as shared molecular pathways and functional domains affected by the disorders [81, pp. 608–621] – both disorders often occur together and cluster in families. Multiple interacting genetic factors and their interactions with environmental factors constitute the major causal determinants of both ADHD and ASD. This interaction can influence epigenetic mechanisms, such as DNA methylation, histone modifications, and microRNA expression, leading to altered development. Brain structural and functional imaging studies reveal both shared and distinct neuronal features and activities. For example, functional magnetic resonance imaging (fMRI) studies have reported both disorder-specific differences and shared deficits in functional brain activation and behavioral performance on tasks of

sustained attention and temporal discounting in youth with ADHD and ASD. The largest structural MRI study of the brain to date of youth and adults with ADHD and ASD has noted differences in maturation, with ADHD-specific smaller intracranial volume in children and adolescents and ASD-specific thicker frontal cortex in adults [80]. In addition, findings suggest developmental abnormalities in the frontal cortex, particularly the prefrontal cortex, which has been implicated in behavioral planning and self-regulation [87, pp. 316–319]. This may explain the wide range of behavioral features seen in both ASD and ADHD. These include low levels of behavioral and cognitive flexibility, impulsivity, difficulties with attentional switching, and a tendency to hyperfixate. Developmental abnormalities in the corpus callosum and subcortical structures that are common to ASD and ADHD have also been identified, which may explain a wide range of specific features of cognitive and motor development [92, pp. 1440–1452; 86, pp. 935–941] – both disorders are diagnosed predominantly in males. Although there are some differences between the two conditions, both are generally associated with social difficulties, executive dysfunction, and language and cognitive delays. Co-occurrence of ADHD and ASD has been observed in both those with and without intellectual disability. Intellectual disability is one of the most common comorbidities of ADHD and ASD, 46% and up to 70%, respectively. About 70% of people with intellectual disability and ADHD also have autism [120, P. 146]. The results of scientific studies indicate that early diagnosis and timely intervention are necessary for effective restoration of social communication and reduction of anxiety disorders in individuals with ADHD and ASD [67, 272 p.].

Section 4

Pavlova Iryna, Kaluzhynskyi Yaroslav

MENTAL HEALTH DISORDERS DUE TO ORGANIC CNS DAMAGE AND PATHWAYS TO RECOVERY

4.1. Introduction. Ways to restore higher mental functions

It is known that destroyed nerve elements do not regenerate and that functions that have disappeared as a result of their damage, it would seem, cannot be restored.

However, it is also known that as a disease progresses, brain functions impaired by focal lesions are gradually restored. It is equally well established that in the case of organic brain lesions, the restoration of impaired functions can only occur through specially organized measures aimed at their recovery.

How can this paradoxical phenomenon be explained on one hand, and how, on the other hand, can rational restorative therapy be organized – based on modern knowledge about the pathopsychological and neuropsychological mechanisms of functional impairment in local brain lesions – to ensure the fastest and most complete restoration of impaired functions?

To answer these questions, it is necessary first to consider modern views on the nature of disorders that arise in focal brain lesions and, based on these views, to outline the main pathogenetically justified ways of their recovery.

There are two types of functional impairments in focal brain lesions.

Each focal brain lesion resulting from hemorrhage, trauma, or tumor has a complex structure. As a rule, it is associated with the fact that some nerve elements that were part of the affected area are destroyed and completely cease to function, while others - located partly within the affected zone and partly in the perifocal (nearby) region - remain preserved, but physiologically come to a state of inactivity. However, the ratio of these two components varies from case to case.

In massive hemorrhages and injuries, the destruction of active nerve elements in a particular cortical zone predominates, while the elements in the perifocal zone (and possibly other functionally related brain regions) may be in a state of inactivity. In cases of contusions and brainstem lesions that disrupt the reticular formation's activating influence on the cerebral cortex, factors that lead to the inactivity of morphologically preserved nerve cells become paramount.

When the primary cause of functional impairment is inactivation (that is, blocking or inhibition of functions), the main method of restoring the disturbed function is its disinhibition and the restoration of synaptic conductivity. Restoration may be achieved through pharmacological interventions that eliminate extraneous inhibition, modify neurotransmitter metabolism, and restore synaptic conductivity, as well as through training methods that alter the level at which the function is implemented, remove difficulties arising during the complex voluntary organization of activity, and engage the residual capacities of the patient's mental functions in typical forms of activity. Naturally, under such influences, the disinhibited function is restored to its former state. This represents the first way of restoring mental functions.

The second way concerns cases in which the impairment results from irreversible destruction of nerve elements. In such cases, restoration of the function in its previous form is impossible. The only remaining approach is to rebuild the disturbed function by engaging preserved neural elements, transferring the function to other intact neural systems, and sometimes radically changing its psychophysiological structure so that the original task is carried out in new ways and with the help of a completely new neural organization. This type includes most cases of recovery of HPF after massive organic brain lesions. Here, restorative retraining techniques play a crucial role, resulting in a function that is not restored in its previous form but instead undergoes a fundamental structural transformation.

Given the fundamental difference between these two ways of restoring functions disrupted by local brain lesions, let us consider them separately, without forgetting that both can often be included in a single complex of restorative work.

4.2 Restoration of functions by disinhibition

Clinical practice shows that the functional impairment that typically occurs immediately after a focal brain lesion (trauma, hemorrhage) is much broader than what would be expected based solely on the spatial location of the lesion. It is also well known that after a certain period, this range of functional disorders tends to narrow, and impaired functions are restored to some extent even without special intervention.

This was explained by the observation that each focal brain lesion is usually accompanied by perifocal changes, edema and swelling, hemo- and CSF-dynamic changes, and, in some cases, a decrease in the normal tone of cortical cells due to disorders of the brainstem reticular formation.

As these pathological phenomena are eliminated (normalization of cerebrospinal fluid and hemodynamics, reduction of edema and swelling, restoration of cortical tone), the temporarily lost functions return to their previous state. All these factors leading to the temporary loss of a wide range of functions have been described in detail in the literature on the acute period of brain diseases. The pathogenesis of such temporary functional disorders in focal brain lesions is complex and has been studied by many authors.

K. Monakov identified a special form of temporary dysfunction in focal brain lesions, which he designated as “diachisis”. According to K. Monakov, each focal brain lesion (trauma, hemorrhage) acts as a powerful stimulus that inevitably produces shock, spreading to parts of the nervous system far from the lesion. This shock-induced spread, which Monakov believed to be selective, can lead to a nonfunctional state not only in the damaged area but also in symmetrically located brain regions within the same functional system.

As a result of such a systemic shock, which reduces the excitability of brain areas within a unified functional system, the entire system may enter a state of temporary inactivity. Only after some time, when the effects of this shock gradually diminish, can

the function inactivated by diaschisis return to an active state and restore itself in its original form.

The mechanism of “diaschisis” – temporary systemic inactivation of function – remained unknown to K. Monakov. Later, it was suggested that these cases involve excessive protective inhibition of preserved brain areas, producing a state similar to the “parabiotic inhibition” described by M. Ye. Vvedensky.

These propositions logically led to the idea of the necessity of protecting such patients from extremely powerful stimulation; for a certain (sometimes prolonged) period, the patient requires a protective regimen that would, in itself, promote the gradual reactivation of temporarily inhibited neural elements. As a result of the temporary inhibition of mental functions, the latter are rendered inactive. As neurophysiological research initiated as far back as the 1930s demonstrated (Cannon; Dale; Nakhmanson et al.), the process of neural impulse conductance, which ensures the normal operation of neuronal complexes, proceeds with the participation of synaptic apparatuses, which affect the transmission of an impulse from one neuron to another. Numerous studies conducted in recent years by a number of authors (Whitaker; Gray; de Robertis) show that synaptic conductance must be regarded as a complex neurochemical process, in which the transmission of neural excitation is effected by specific chemical substances — mediators.

The primary pathway for restoring function in this case is the removal of inhibition — that is, the restoration of synaptic conductance through pharmacological modulation of mediator exchange. Such a disinhibiting influence was traced in disturbances of motor functions and sensory capacities.

The study of speech disturbances and their restoration has demonstrated that in the early period following the disease, speech disturbances may be caused both by lesions of the "speech zones" of the left hemisphere and by lesions of zones extending far beyond their limits (Luria). However, as observations conducted by A.R. Luria on significant material (269 long-followed cases of aphasia arising after gunshot wounds of the left hemisphere) and our own observations of more than 400 patients with aphasia (Tsvetkova) have demonstrated, "speech disturbances prove to be temporary,

remaining stable only in cases where the focus is localised within the limits of the 'speech zones'; in cases of perifocal location of the primary focus, these speech deficits undergo reverse development." It is characteristic that spontaneous restoration of speech functions over 6–8 weeks after the wound is observed with particular clarity in cases of non-penetrating wounds of the "boundary" areas of the left hemisphere — areas bordering on the "speech zones" but not forming part of them. These facts indicate that in the spontaneous restoration of disturbed speech functions, an important role is played by the elimination of the inhibitory state in which the corresponding neural apparatuses of the cortex are found.

4.3 Restoration of functions by vicariate

The restoration of temporarily suppressed functions through their disinhibition is to be distinguished from the restoration of disturbed functions through their displacement to the preserved areas of the cerebral hemispheres. This form of functional restoration — once considered the primary pathway — was often referred to as "vicariation." Even certain physiological observations suggested that neural tissue in proximity to the lesion's focus (provided it is not itself in a pathological state) may exhibit heightened excitability and assume the functions of the affected area. The classical facts were adduced in their time by A. Gelb and K. Goldstein, who demonstrated that, in cases of disturbance of the normal state of the macular portion of the retina, a pseudomacula (or a functional area of heightened excitability) may form in its peripheral portions, which then begins to perform the role of the macula, reorganizing the visual fields accordingly.

The degree of substitutability of destroyed cortical brain areas by adjacent areas does not remain the same, and varies with the different localization of the focus. In cases of lesion of highly differentiated cortical zones (for example, the motor, sensory, and speech areas), the possibility of such displacement of the disturbed function to adjacent areas is minimal. In cases of lesion of the newer and — in H. Jackson's words — least differentiated areas, such a possibility may be maximal. Thus, disturbances of functions

in cases of restricted foci of brain lesion situated within the limits of the prefrontal cortical areas may proceed without any noticeable symptoms (Luria).

However, the greatest interest lies in the restoration of disturbed functions by their displacement to the other, preserved hemisphere. Careful study of the facts demonstrated that, during the operation of certain points of one hemisphere, the excitation of symmetrical points of the other hemisphere changes, and that these changes are preserved for a prolonged period. As Morell's observations demonstrated, after intensification of the activity of certain points of a hemisphere, the content of ribonucleic acid changes substantially in the symmetrical points of the opposite hemisphere; these changes are preserved for a sufficiently long time.

These data on the existence of "mirror foci" arising in the symmetrical hemisphere give reason to believe that all brain activity actually engages both hemispheres, and that the symmetrical hemisphere participates in the activity of the immediately operative hemisphere — albeit in particular roles.

The degree of probability of such engagement of the subdominant hemisphere in the realisation of functions (in particular, speech functions) formerly carried out by the dominant hemisphere, however, does not remain the same and varies considerably across different individuals. A number of studies conducted in recent years (Subirana; Zangwill et al.) have demonstrated convincingly that absolute dominance of the leading (left) hemisphere is observed far less frequently than could be assumed; these studies noted that in a significant number of cases, where one of the hemispheres is only partially dominant, the speech function is in fact carried out with the participation of both hemispheres.

A number of researchers resolve the question of the role of the right hemisphere in the restoration of speech negatively. This view is held by well-known researchers on the problem of localisation of functions in the human brain — the Canadian neurologist W. Penfield and the American neurosurgeon L. Roberts. They hold that the right hemisphere takes no part in the restoration of speech, and that the fact that speech is restored after damage to any areas of the left hemisphere does not yet indicate that the right hemisphere assumes these functions, since there are other facts — namely: (a)

repeated lesions of the left hemisphere again lead to aphasia; (b) lesion of the right hemisphere in these same patients, after the left hemisphere had been lesioned and speech had been restored, does not lead to aphasia.

W. Penfield and L. Roberts hold that an intrahemispheric restructuring occurs and that the preserved zones of the left hemisphere assume the speech function. "Many authors admit," they write, "that the homologous field of the opposite hemisphere assumes the function of the affected field. We have been unable to find in the literature satisfactory cases in which aphasia following lesion of the left hemisphere disappeared and then recurred upon lesion of the right hemisphere" (Penfield).

However, the question of the role of the right hemisphere in the restoration of speech functions has not yet received a definitive resolution.

4.4 Restoration of functions by restructuring functional systems

In all of the cases described above, the function that is restored as a result of disinhibition or displacement to the other hemisphere is restored in its previous form, without undergoing any noticeable structural change.

The greatest interest is represented, however, by another type of case (which occupies the leading place in clinical practice), where a group of neural elements that had participated in the realisation of this function remains destroyed, is not replaced by other (perifocally or symmetrically situated) neural elements, and where, despite this, the possibility of performing this function is restored after a certain time.

In this case, what is at issue is the restoration of function through the radical restructuring of the functional system, and this pathway of the recovery of lost functional capacities merits particularly close examination.

The fact of restoration of functions through the restructuring of functional systems was adduced repeatedly in the literature. At the very origins of scientific physiology, this fact was discovered and demonstrated by P. Flourens, who resected the nerves conducting to and from the wing of a rooster and observed the rapid restoration of function through restructuring of the functional system. Subsequently, analogous facts

of the high plasticity of the nervous system were described in the classical experiments of A. Bethe, and then in the widely known experiments of K.S. Lashley and others, which demonstrated with what ease an animal with damaged limbs or a disturbance of the central nervous apparatus begins to carry out its former task by new means. All investigators noted that in a number of cases, restructuring of functional systems in lower animals proceeds so easily that it sometimes arises spontaneously and requires virtually no special retraining.

However, at subsequent stages of evolution, such restructuring of functional systems does not proceed as rapidly; it requires the participation of higher levels of the central nervous system — the cerebral cortex — and is subject to a series of rules studied in detail by P.K. Anokhin and E.A. Asratyan (Asratyan; Shokhot-Trotskaya).

As observations demonstrated, the process of restoration of a disturbed function through the restructuring of the functional system proceeds even more complexly in humans, and in many cases requires specially directed restorative training. With respect to the restoration of HMF in humans, the only pathway that has received theoretical scientific substantiation, experimental confirmation, and wide introduction into practice — attesting to its high efficacy — is the pathway of restructuring functional systems by means of prolonged specialised restorative training of patients.

This pathway for HMF restoration was developed by Soviet psychologists during the Great Patriotic War, when they established the scientific foundations for restoring mental functions and restorative training. The foundation for the positive resolution of the problem of functional restoration was provided by new psychological conceptions of mental function as a functional system, its formation over the course of a lifetime through object-related activity, and the primacy of the social dimension in the human psyche. Not only the theory but also the practice of restorative work demonstrated the possibility of HMF restoration, and the only effective pathway of restoration proved to be the pathway of restructuring functional systems — either on the basis of incorporating the preserved links of the disturbed system (intrasystemic restructuring) or through the incorporation into the functional system of new links in place of the disturbed ones (intersystemic restructuring).

During these years it was also demonstrated that the functional system newly constructed in the process of training is capable of fulfilling the task, realising the disturbed mental function. Such restructurings do not arise spontaneously in humans. The method that produces this effect was developed — the method of conscious restorative training or retraining. The leading role in the development of this pathway for the restoration of HMF, and in particular of speech in aphasia, belongs to A.R. Luria, the renowned psychologist and founder of Soviet neuropsychology.

This question will be examined in greater detail below, in the relevant section.

4.5 Spontaneous restoration of HMF

The problem of spontaneous restoration of HMF has long interested researchers, and the literature addressing these questions encompasses numerous titles. It is known that nerve cells do not regenerate, yet clinical practice with brain lesions has frequently encountered spontaneous restoration of — in particular — speech. Does spontaneous restoration of speech exist, or can speech only be restored through specific intervention directed at the defect?

Different researchers have answered this question in different ways, and it still awaits resolution.

A.R. Luria held that three causes may underlie the spontaneous restoration of speech in aphasia:

1.In the case where a wound does not destroy the brain substance but only causes a temporary suppression of these brain areas, and when this suppression and inhibition disappear, the function is completely and spontaneously restored.

2.A second mechanism of spontaneous restoration may consist of the displacement of the given function from one brain area to another, which compensates for the defect. This functional displacement may take various forms, "...ranging from 'vicarious' compensation... to a complex restructuring of the function itself."

3.Some French researchers expressed the opinion that the rapid reverse development of aphasic manifestations can be explained either by the transfer of function downward to the system of motor subcortical ganglia of the given hemisphere, or by transfer to the corresponding zones of the right hemisphere.

Spontaneous restoration depends on the nature of the brain lesion (specifically, in cases of damage to boundary zones rather than the speech zone itself) and on the uneven dominance of the left hemisphere. Researchers long ago expressed the view that there is no absolute lateralisation of speech functions, and that the right hemisphere also participates in the organisation and realisation of speech. This view, expressed by H. Jackson and H. Bastian, received considerable later support from K. Goldstein and others. This position regarding the positive influence of the right hemisphere on the restoration of speech is also held in our time by a number of authors (Critchley; Luria; Tsvetkova).

Domestic researchers hold that when the affected brain area is a sufficiently large speech zone, and when a qualitative analysis of the defect indicates the dropout of the central factor or link of the functional system, spontaneous restoration of the disturbed function is, in such cases, impossible (Luria, Tsvetkova). Only the dynamic components of the defect syndrome, as these researchers held, may undergo spontaneous reverse development. Views also exist regarding the possibility of spontaneous functional restoration through automatic compensation for the disturbed function. These compensations may be intra- and intersystemic.

Speech zones of the brain: Broca's area (the inferior portions of the posterior frontal region — efferent motor aphasia arises here; dynamic aphasia arises anterior to Broca's area); the retrocentral (inferior parietal) cortical area (afferent motor aphasia arises here); the temporal area (sensory aphasia arises here — Wernicke's area; acoustic-mnestic aphasia arises in the second temporal gyrus); the temporal-parietal-occipital area (TPO — semantic and amnestic aphasias) — and may proceed at different levels of organisation of the disturbed function. Let us provide examples. In cases of disturbance of the phoneme discrimination process through defects of acoustic gnosis (phonemic hearing disorder), the patient, in order to understand the speaker, watches

their lips and the operation of the articulatory apparatus. The incorporation of another system — the optic analyser — promotes the actualisation of inter-analyser connections (acoustic, speech-motor, and optic analyser systems). This pathway facilitates the comprehension of addressed speech. The patient's swaying of the trunk and head, combined with simultaneous tapping of the rhythm of the phrase formed at the level of inner speech, facilitates its vocalisation. That is, the patient's spontaneous incorporation of the elements of the rhythmic structure of the phrase (its transfer to a lower level of organisation of oral speech) frequently assists the articulatory aspect of speech.

However, these are all examples not of the spontaneous restoration of speech as a full-fledged process, but of spontaneous compensatory restructurings as defensive mechanisms. It is known that not every spontaneous functional restructuring is beneficial for restoring speech and verbal communication. In the clinical practice of aphasia, negative, compensatory restructurings are observed, as are restructurings that arise in the course of incorrect training and which, for a prolonged period, impede the productive restoration of the disturbed function (Beyn; Kogan; Leontyev; Luria; Tsvetkova et al.). Contemporary foreign researchers resolve the question of spontaneous restoration of speech in aphasia in different ways. In general, many of them take a positive view of this question. However, they relate the process of spontaneous restoration to a very large number of factors.

Etiology of the disease. Thus, Kohlmeyer (Kohlmeyer) reports that aphasia occurs in 93% of cases with acute cerebral circulation disorders, and if it persists for two weeks, the prognosis for spontaneous restoration is unfavorable. In comparison with vascular etiology, aphasias arising from craniocerebral trauma have a generally more favorable prognosis, including greater possibilities for spontaneous restoration. Spontaneous restoration depends on the severity, prevalence, and localization of aphasia (Luria). Global, severe, and persistent aphasias are the result of a large lesion of the Sylvian sulcus (Kerterz).

Type of aphasia. Speech recovery is worst in total aphasia (Kogan; Paivio). The majority of researchers believe that speech recovery in Broca's motor aphasia is better

than in sensory aphasia, especially when sensory aphasia is aggravated by jargon-aphasia in combination with old age.

Hand dominance. Many researchers have noted that the cerebral organization of speech differs between right- and left-handed people and that ambilateral speech structure is more pronounced in left-handed people (Luria; Kimure; Rasmusen et Milner, etc.). Some authors believe that in left-handed people, a wider cortical area is involved in speech. All this is consistent with the data on the spontaneous evolution of aphasia: in left-handed people, aphasia occurs both with damage to the right and left hemispheres of the brain, the symptoms of aphasia are less pronounced, and recovery is more complete and faster (Luria; Nesaep; Seron). A. Gloning et al. (1976) even consider right-handedness to be a negative factor in the dynamics of aphasia. A. Subirana believes that familial left-handedness is a prognostically favorable factor for right-handed people.

Among other factors, attention should be paid to anosagnosia (i.e., impaired awareness of one's deficits) and motivation, which can influence the dynamics of aphasia.

Age. Regarding the question of the influence of age on the recovery of HPF, including speech, there are conflicting opinions, and this is explained by the multifactorial nature of the phenomenon, that is, the patient's age never acts as a single factor, but is part of a system of other factors that aggravate the dynamics of aphasia (etiology, duration and severity of aphasia, etc.). C. Hagen believes that the question of the role of restorative learning and spontaneous speech recovery remains unresolved. In any case, in his study, where 10 patients were trained, and the other 10 were not, both groups showed improvement in speech in the first three months. However, only the group that was trained and continued training showed improvement after three months. L. Vignolo takes a special position, recommending studying spontaneous recovery and considering restorative learning not as the only way to restore speech, but only as one of the components of the impact on the patient. Thus, spontaneous recovery, according to many authors, is closely related to several factors and strictly dependent on them. All these variables are intricately interconnected and interdependent, and their (these

variables) different combinations affect the spontaneous dynamics of speech in different ways.

Seven factors play a leading role: etiology, localization, extent of the lesion, initial severity of the speech disorder, onset of the disease, period from onset to the first examination, form of aphasia, and hemisphere dominance.

Among domestic researchers on this issue, it is worth noting the works of A. R. Luria, mentioned above, and L. G. Stolyarova, who believes that there are favorable conditions for spontaneous speech recovery only in a group of patients with a deep location of the focus of brain damage, as well as with the absence of damage to the cortical speech areas during cerebral hemorrhage (Stolyarova).

Our studies (on 179 patients) showed the advantage of restorative, directed training of patients with aphasia. We have identified a number of factors that affect the success of patients' learning: the severity of aphasia, the form of aphasia, the time of onset of aphasia (without influencing it), and the patient's personality (Tsvetkova). In our further studies, conducted together with graduate student L. Oliva, these data were confirmed.

Below, we will briefly discuss this study, which examined the problem of spontaneous speech recovery in patients with aphasia.

4.6 Restoration of HMF by using medication

There is another way to restore the HPF, which scientists have repeatedly turned to - the way of drug therapy. During the Great Patriotic War and immediately after, it was used widely. It was indicated above about its use in the case of disinhibition of functions by influencing specific substances - mediators on the synaptic conductivity of neuronal complexes. One of the common mediators at that time was acetylcholine, which, however, turned out to be unstable and was destroyed by the enzyme cholinesterase, thereby blocking synaptic transmission.

Therefore, anticholesterase drugs (proserin, ezerin, dibazol) began to be used to restore normal synaptic conductivity and temporarily activate functions that were temporarily

inhibited. All this was first used during the Second World War in cases of gunshot wounds to the brain. The use of proserin (prostigmine) in Perdyman`s observations had a positive effect on tactile and pain sensitivity, as well as on motor function in the paretic limb.

However, attempts to use proserin for "disinhibition" therapy of gnosis, praxis, and especially speech proved ineffective (Luria). In 1961, it was possible to obtain disinhibition of complex gnostic and practical, as well as speech defects (in dysarthria) with the help of a new drug, galantamine. It turned out to be a powerful cholinesterase inhibitor (Vinarskaya, Rudaya).

Recently, in studies devoted to the rehabilitation of patients with impaired HPF, in particular with aphasia, relatively little attention has been paid to the use of drug therapy. Meanwhile, in the process of restorative learning, both at the stage of disinhibition of speech processes and at the stage of creating a new functional speech system or its restructuring, pharmacotherapy should occupy a certain place.

In the 60s and 70s, in works devoted to drug therapy of patients with aphasia, the main attention was paid to curare-like drugs targeting synapses - midakalm, zlatin, meliptin (I. A. Krymova, V. V. Alyakrinsky).

Any function of the organism, as P. K. Anokhin demonstrated, begins with afferent synthesis, and at this stage the decisive significance lies with emotional and motivational states and memory processes, which are most sensitive to pharmacological influences. Together with L. T. Popova, N. M. Pylaeva, N. Yu. Shovska and R. M. Shovska conducted a series of experiments using four drugs - instenon, complamine, encephalon, and gamolone. These drugs have a positive effect on cerebral blood flow and brain metabolic processes.

In addition, encephalon and instenon have a certain psychotonic effect, exciting neurons in the reticular formation. Complamine and instenon improve cerebral blood flow (Tsvetkova) and positively affect cerebral blood flow and brain metabolic processes.

In some patients, a positive effect was observed on repetition, naming, writing, and reading. Thus, the use of instenon in a post-stroke state, especially in patients with motor forms of aphasia, demonstrated therapeutic effectiveness, increasing general working capacity, general speech activity, and, especially, the emotional-volitional sphere. The remaining three drugs also had an effective effect on the restoration of general and mental activity, speech activity, and improved recovery of mainly involuntary forms of speech. The most effective were the recovery courses in patients who were on the background of complamine and encephalobol.

For a complete description of the ways of recovery of HPF, one more way should be indicated - the restoration of inhibited functions by changing the attitude of the individual. Not always is the inhibition of functions simple in nature; it can be removed by the use of medicinal effects. "In some cases, inhibition of functions is the result of a kind of fixation of the original defect", and such a defect can be eliminated only by "changing the mental attitudes of the individual".

Inhibition of functions as a result of a gentle attitude of the individual has been described repeatedly. Thus, in the case of contusion, a psychogenic reaction can often occur, as a result of which the restoration of functions is delayed. Most often in these cases, inhibition spreads widely, capturing entire functional systems.

Drug therapy, as practice has shown, does not help in these cases. Here, psychological influence is needed to change the patient's attitude and thereby include the inhibited function within the system of actively operating mental processes. Many such cases were described during the war.

Thus, five possible ways of restoring higher mental functions, including speech in the case of aphasia, have been considered. An analysis of the literature and our own experimental data leads us to the following conclusions for this section.

1. The ways of restoration exist, and all of them are diverse.

2. Their diversity depends on a number of factors, and primarily on the topic and extent of brain damage, the pathogenesis of the defect, the etiology of the disease, the general duration of the disease, etc.

3. When choosing a particular path to overcome defects in patients, a specialist (neuropsychologist, speech therapist, or doctor) must take into account the entire multifactorial nature of the defect.

4. The analysis of the literature provides grounds for an important practical conclusion about the need for the simultaneous use of not one, but two or three ways of recovery. Thus, the restructuring of functional systems is well combined with medication and elements of functional disinhibition through psychological and pedagogical methods. However, today, in cases of damage to the morphological formations of the brain, that is, the brain substance itself, the optimal and leading way still remains the rational influence on the defect by the method of restorative training. Our special studies have confirmed this position.

1.7 Psychological aspect of aphasia

One of the most important ways to achieve the effectiveness of remedial training is to understand the defect itself and, first of all, the mechanisms of its occurrence. Therefore, the task of researchers: aphasiologists, neuropsychologists, speech therapists, and other specialists is to further experimentally study aphasia in all its multifacetedness and complexity, one of the tasks of which is to develop scientifically based methods for overcoming aphasia for the rehabilitation practitioner.

Aphasia is a complex speech disorder. Therefore, to deepen understanding of the nature, structure, and mechanisms of speech disorders, it is necessary to study various aspects of aphasia and employ appropriate methods. The most valid and reliable method for studying aphasia was the neuropsychological method, which encompasses psychological, linguistic, and neurological aspects. Using the neuropsychological method of analysis, the author, together with students and employees of the laboratory of neuropsychology and restorative education, headed by the author of this book, conducted several cycles of aphasia research, in each of which one or another aspect of the defect was dominant. Here we will briefly dwell only on some experimental data, the consideration of which is useful not only for the purpose of demonstrating the need for knowledge of the defect to increase the effectiveness of restorative education, but also for the application of these data by specialists of various profiles in research and

practical work (psychologists, neuropsychologists, linguists, psycholinguists, speech therapists, etc.).

One of the most important problems in the study of the psychological aspect of aphasia is the question of the relationship between speech disorders in aphasia and defects in other mental functions. For a long time, up to the present day, aphasia was considered a purely linguistic or speech disorder (M. Critchley et al.). Below, we will briefly describe our own experimental data, which give reason to believe that aphasia is not an isolated speech defect. Its nature and mechanisms of occurrence are closely related to defects in other mental processes. These statements about the systematic nature of the speech defect in the case of aphasia, about its connection with the violation of other mental processes, on the one hand, and about the influence of defects in other mental processes on the formation of the structure of aphasia, on the other, were most clearly manifested during the study of acoustic-mnemic aphasia, and primarily violations of the naming process.

Below, we will describe our new data on several aphasia-related problems that still need to be resolved.

4.8 Aphasia and object image. Object naming disorder

Naming an object is one of the most complex speech processes. The problem of the nature and structure of the naming process once interested many great aphasiologists, linguists, psychologists, and neurologists, such as I.M. Sechenov, O.A. Potebnya, L.S. Vygotsky, K. Goldstein, G. Head, and others. The question of the mechanisms and nature of naming disorders has gained particular interest in pathology, particularly in cases of impaired nominative function of speech due to local brain lesions; for many decades, it has been the subject of fierce debate.

Different fields of knowledge study the process of naming objects in different aspects. The study of impaired nominative function in speech makes it possible to approach a more intimate aspect of the naming process, usually hidden from the researcher's eyes.

Such a side of speech is primarily its level construction, the interaction of levels and links in the structure of speech, its interaction with other mental processes, etc.

It is widely known that in clinical aphasiology, the nominative function of language — that is, the naming process — is disturbed in all forms of aphasia. This process plays a significant role in the formation and realisation of language's communicative and cognitive functions. The prevalence of this defect, its little study, and the lack of correct methods for overcoming it have made the study of this problem, the nature and mechanisms of the naming process disturbance in aphasia, very relevant. From the works of A. R. Luria, it is known that naming defects in motor forms of aphasia, as well as in sensory ones, are secondary. This issue has been the least studied in acoustic-mnestic and amnestic forms of aphasia, which have become the focus of research.

Our own studies and clinical practice have made it possible to put forward an assumption about the connection between naming disorders in these forms of aphasia and defects in visual perception and object image representations. In modern psychology, imagery is assigned a significant role in the formation and development of speech, in its structure and course (Vygotsky; Ananyev; Elkonin; Luria, 1975; Paivio et al.). Many researchers adhere to the view of the dynamic interaction and mutual influence between speech and imagery, which can change depending on the chronogenetic factor, exercises, or disorders arising from brain lesions (Vygotsky; Luria).

Literary data and clinical observations indicate that in the case of acoustic-mnetic aphasia, the complex nature of the naming disorder attracts attention, associated not so much with defects in the sound structure of the word and its implementation, as with a violation of the process of actualization of the desired word, as well as the dissociation, which often occurs, between the correct pronunciation of the word and the complete loss of its meaning. The cause of this phenomenon should be sought not so much in the language itself as in the violation of the relationship of language with other mental processes. As the central defect and psychological mechanism that determines the entire syndrome and the nature of the course of speech disorders in this form of aphasia, A. R. Luria puts forward a violation of auditory-speech memory, and the physiological

mechanism of this disorder considers the pathological weakness of cortical cells, which easily passes into extralimiting inhibition. Hence, this aphasia in the classification of A. R. Luria received its name, acoustic-mnestic, in contrast to the widely known sensory, or acoustic-gnostic, aphasia, which is based on defects in the process of acoustic sound discrimination, that is, defects in phonemic hearing.

The complex anatomical and morphological structure of this area of the cerebral cortex, and its connection with the visual zone, led us to assume a complex effect on speech pathology when this area of the brain is damaged, particularly regarding the possible pathology of visual-auditory connections. Researchers believe that only a violation of the interaction between at least two analyzer systems can lead to the peculiar picture of speech impairment, particularly in the naming function, observed in acoustic-mnestic aphasia.

As for amnestic aphasia, it is characterized by the fact that its central defect - a disturbance of object naming - usually occurs against the background of relatively preserved all other types of speech - oral (impressive and expressive) and written.

In a number of psychological studies, naming an object is associated with recognition. This connection was pointed out by I. M. Sechenov, who first proposed a hypothesis about the mechanism of naming. He wrote that the recognition of objects is the result of complex processing of repeated external influences, involving the comparison of the real representation with the existing one. Recognition often follows those features that have already been separated in the sign. The allocation of the distinguishing features of an object in the process of comparison for the purpose of its recognition is inherently connected with the process of naming (Sechenov). The same opinion is expressed in modern Soviet studies that follow the line of studying the process of recognition-recognition (Lomov; Rubakhin; Shekhter, etc.). Researchers distinguish several links in the recognition process. Thus, B. F. Lomov considers the main components of this process to be the formation of a perceptual image, its comparison with the system of "standards" stored in memory, and the selection of the one that corresponds to the image. V. F. Rubakhin attaches significant importance to the analysis of the features of the object when forming its image in the process of perception. Researchers tend to

associate the naming process primarily with the isolation of the object's essential features, although they indicate that, in general, naming results from the "activation" of all links and is directly related to the isolation of the object's characteristic features. M. S. Shekhter writes: "...the result of the comparison process is a signal in response to which the mechanisms of connections formed in past experience are triggered, for example, connections between the characteristic features of objects of a given class and their verbal designation" (Shekhter).

So, the word has a sensory basis, and the process of naming is associated with the process of recognition, and primarily with the allocation of characteristic features of the object. The connection between the word and its sensory basis has been noted by many researchers. Performing the function of designation, the word is a "specific unity of sensory and semantic content". The word that designates highlights the essential in the object (phenomenon), generalizes it, and thereby introduces the phenomenon (object) into the system of objects or phenomena. In the literature on aphasia, all authors emphasize the characteristic feature of amnestic aphasia, which is that patients cannot find, first of all, those words that designate objects. Words that designate features, qualities, etc., of objects are actualized much more easily. This is also evidenced by our own practice.

Literature data indicate another significant circumstance, namely, the presence of subtle defects in object optical gnosis, which often occur in the syndrome of amnestic aphasia. Our practice also often dealt with similar symptoms accompanying this form of speech impairment. And finally, anatomical and morphological data indicate connections between the posterior temporal and inferior parietal regions of the cerebral cortex and the occipital cortex. All this raised a number of questions for us: is the defect in the actualization of an object-related word associated with disorders of the gnostic level of the word, namely with defects in the process of object recognition, and what link in the recognition process must be impaired in this case to lead to a violation of the actualization of the desired word?

Using literary data and materials from our own rehabilitation work with the relevant patients, we developed a methodology and conducted a study, the hypothesis of which

was the assumption that the nature of the violation of the actualization of the desired word in these forms of aphasia is associated more with a violation of the gnostic basis of the word than with a violation of categorical thinking. As for the violation of the mechanisms for choosing the desired word through pop-up alternatives, it may be a violation of the link to the characteristic recognition features of the object. The experiment conducted with patients with amnestic and acoustic-mnestic aphasia (Tsvetkova) consisted of two parts. In the first part, the ability of patients to distinguish essential features of a class of objects and individual objects of the class at the level of visual perception of the object or its visual representation was investigated. For this purpose, two methods were used: the drawing method and the method of classifying stylized animal images. The question was asked: is the isolation of characteristic features of individual objects impaired in patients, and if so, what features are impaired - generalized, characteristic of an entire class of objects, or more specific, characteristic of individual objects of the class?

In this part, four series of experiments were conducted using the drawing method: 1) drawing the specified details to the whole object named by the experimenter; 2) drawing a specific object using the word-name of the given object; 3) drawing fragments to a class of objects (vegetables, furniture, etc.); 4) drawing the specified elements to any objects (without naming).

The first part of the experiments revealed that patients with amnestic and acoustic-mnestic aphasia had impaired isolation of distinctive features of a specific object, both at the level of visual perception and at the level of visual images. The process of distinguishing distinctive features, characteristic not of a single, but of a whole group of homogeneous objects (class of objects), remains preserved in patients. The word denoting an object (subject) did not help to actualize its image, which was evident in a series of experiments where it was necessary to draw an object after the word-name.

The obtained facts may indicate that the basis of the described form of amnestic aphasia is a violation of the sensory basis of the word, which leads to difficulty in the naming process. The data described were verified in several works by our students: N. G. Semenova, N. G. Kalita, and S. K. Sivolapov. The question arises: how is this defect

of the gnostic process reflected at the level of speech? In what does it manifest itself? It was assumed that words denoting specific objects would be actualized with greater difficulty in patients than words denoting the signs and relations of objects, that is, those signs inherent in objects in the real world. To test this hypothesis, a special experiment was conducted, confirming the assumption. Patients with amnestic and acoustic-mnestic aphasia participated in the experiment. They were shown 100 pictures depicting: a) everyday objects; b) objects from children's vocabulary; c) natural phenomena; d) actions; e) qualities of an object (its color, taste, shape). Each patient was shown the pictures 10 times, and the time to actualize each word for each patient was recorded. The obtained material was subjected to quantitative processing. The average time per word for each patient and for all patients was calculated. It turned out that for all patients, the time of actualization of words was distributed as follows (in order of increasing difficulty of actualization):

- words denoting quality, - average time 2 min 5 s (1.4-7.0 min);

- words denoting action, - average time 9 min 3 s (2.6-20.0 min);

- words denoting objects, - average time 1 min 5 s (4.0-34.0 min).

Thus, if the first part of the experiment revealed a violation of the separation of essential features of specific objects, then the second part showed that it is precisely the words-names of specific objects that are actualized much more difficult than words that denote the qualities and relations of objects, that is, those features of the real objective world that do not have complex visual images as their basis. These data, on the one hand, once again confirm the assumption about the connection between the violation of the nominative function of language and the violation of the gnostic basis of the word, and on the other hand, show that words that denote more generalized and abstract relations of the objective world are actualized more easily than objectively related words.

The conducted study revealed a connection between the violation of naming and defects in the visual sphere, that is, with defects in the perception of objective images-representations, as well as a violation of the connection of the latter with verbal designations.

Violation of the gnostic basis of the word is manifested in defects in the allocation of characteristic features of a separate object, in the tendency to equate the features of a separate object with features characteristic of a homogeneous group of objects. The specific mechanism of this defect is a violation of patients' ability to isolate the essential features by which objects are recognized. At the level of speech, this defect manifests as a violation of verbal selectivity. As a result, all words become equally probable, and the actualization of the desired word is replaced by searching through all words from one semantic group.

The author's hypothesis concerning the connection between violations of the naming process and defects in visual perception and visual imagery, with violations of connections to verbal designation, has been confirmed in a number of other studies. In some of our experimental work, restorative training (Tsvetkova) was used as the primary method for studying the nature and mechanisms underlying the violation of the nominative function of speech in acoustic-mnestic aphasia. In these works, the restoration of the naming process was not achieved directly by addressing the speech defect but indirectly by correcting the defect in the visual perception of objects and their images. The main work was carried out on the restoration of visual, object representations, and their connection with verbal designations. Analysis of the dynamics of naming restoration indicated that the effect of restoring the naming function depends on strengthening visual perception and visual imagery. In our other works, a correlation was established between the degree of violation of the nominative function of speech and the degree of violation of visual object representations.

Using the method of drawing objects by the word-name, as well as by the method of completing a given fragment of any object or abstract figures to a specific object (a broken line, a square, a circle, etc.) by the image-image that arose in the patient, it was found that a greater number of distorted or incorrectly executed drawings correlates with a greater degree of violation of the process of naming objects. Restoration of object images leads to the restoration of the naming function. In patients with other forms of aphasia (motor and dynamic), no impairment of object drawings was found by the type of their distortion or contamination, but a deficit of object drawings was revealed.

In all experiments using the drawing method (free visual associations - "draw any objects", completing a fragment to the whole, etc.), only patients with acoustic-mnemic and amnestic aphasia began to perform the task without indicating their intention with the word-name of the object they were going to draw. When the experimenter asked what the patient was thinking of drawing, all patients with acoustic-mnemic aphasia gave an unequivocal negative answer: "I don't know." And only during the drawing process, and more often after its completion, did the patients label the drawing with the appropriate name. Patients with other forms of aphasia began to perform the "draw any objects" task by naming the objects. These facts may indicate a violation of the speech organization of visual experience, that is, visual images, in patients with acoustic-mnemic aphasia.

The study of the visual sphere - perception and image representations in patients with forms of motor and dynamic aphasia showed that they also have disorders, but only in terms of mobility, dynamics, and richness of visual images. They have a deficit and poverty of object representations.

Since the image is not only visual, or auditory, or tactile, but is a "node of modal sensations", it should be expected that in aphasia the image will be disturbed in terms of other modalities as well. This hypothesis was confirmed in other studies. It turned out that in all forms of aphasia, not only visual but also auditory and tactile images and representations are disturbed (Tsvetkova, Sivolapov). All these defects manifested themselves differently and depended on the form of aphasia, that is, the mechanisms of speech impairment. The fact of the connection between the violation of word understanding, its actualization during the naming of objects, and during free verbal associations with the violation of visual object images during acoustic-mnetic aphasia was confirmed in a number of other experiments, which studied the abilities of patients with acoustic-mnetic aphasia to isolate their constituent parts (morphemes) in words. In these experiments, the preservation of lexical and extralinguistic word meanings in patients was investigated. In patients, the phenomenon of secondary de-etymologization, simplification of the word, a phenomenon discovered by the well-known Russian linguist V.L. Bogoroditsky, as a result of which the word ceases to be felt in its morphological composition, forming a morphological unity that carries a real

lexical meaning, not a genetic one. In patients, this genetic derivational meaning reappears; the extralinguistic lexical meaning is disrupted, and the word is associated with the word that gave rise to it and the root morpheme rather than with its actual meaning.

In these experiments, patients, when asked to divide a sentence written as a continuous string into separate words, identified morphemes (component parts of words) rather than words. (For example, "en-closed", etc.). This and other facts indicate that the word in patients loses its objective extralinguistic lexical meaning.

Thus, our studies have shown that the basis of the defect in the process of naming, actualization of the word-name in the case of acoustic-mnetic aphasia and amnestic aphasia are defects in the speech organization of visual experience - accuracy and differentiation of perception due to impaired isolation of essential features (micro-features that carry meaning) and organization of actualization of the desired visual image, as well as poverty, impaired dynamics of the subject images themselves.

The described studies indicate a violation of the subject image-representation across all forms of aphasia, but differ across these forms. Violation of the subject image in acoustic-mnetic aphasia is one of the mechanisms that leads to defects in naming, repetition, and understanding of speech. However, if we recall the modern ideas in psychology about the image not as a picture, but as a complex formation that is formed inseparably from the formation of knowledge and meanings, then the importance of these provisions becomes clear when considering the problems of aphasia - its nature and mechanisms, its connection with other mental processes. A. M. Leontiev wrote that the image also includes meaning, and that the picture of the world in a person is formed through the image. Such a significant role of the image in the mental sphere of a person during its formation and course makes it possible to interpret the above-described facts about the violation of the image in the case of aphasia not only as a violation of one of the ways of encoding a word, which leads to defects in individual specific speech processes (naming, understanding, repetition, etc.), but also to a violation of the system of meanings of the word, its connection with the material

carrier, etc., that is, to the disintegration of the complex system in which the vocabulary is located.

These data should be taken into account when developing methods for overcoming speech defects, in particular, the naming process. Already from this brief description, it becomes obvious that the method of memorizing word names with the illustration of subject pictures, known in practice, is not adequate to the nature and mechanisms of the disorder and therefore does not give the desired effect; moreover, it can only deepen the defect. This direct speech method is aimed at consolidating the direct connection between the word and the picture by repetition and memorization, bypassing the image-imagination, although it is known that the connection of the word with the object is mediated through the generalized meaning of the word, through a concept or image, and the verbal designation itself is the crystallization of objective experience.

Therefore, the mentioned method of memorization, widely used in the practice of teaching patients with aphasia (adults and children), may be inadequate on at least three grounds. First, due to the primary violation of the sensory basis of the word, and in particular visual images, it is presented in amnestic and acoustic-mnestic aphasias. Secondly, the technique itself precludes its use, as it operates only at the verbal level and ignores other levels of word organization. In this method, the picture serves only as an illustration, not as the subject of the action. Thirdly, this is why the speech technique in such cases will be inadequate for the nature of the speech disorder and will not achieve the desired effect. In the best case, only the formal effect of learning, but not learning, will be obtained. At the same time, a full-fledged speech will not be formed, and the word will not appear in all its multifaceted meanings. The establishment of the subject-word connection cannot be reduced to single and only verbal associations.

In later years, we continued this theme in a cross-cultural study, working with Spanish-speaking patients. Our graduate student and I received interesting data that fully confirmed the hypothesis and its feasibility in the process of restorative learning.

Thus, active mastery of the word requires the restoration of the "base of speech", that is, the sensory basis of the word, and primarily the polymodality of images of objects,

their connection with the word-name, and the ability to actively act with the object. Therefore, the methodology for restoring speech, in particular its nominative function, should begin with methods that form visual perception and image representations, their accuracy, differentiation, and mobility, with their subsequent connection with the word. To do this, work should begin with non-verbal techniques and on non-verbal material.

Speech disorders arising from lesions of the second temporal gyrus of the left hemisphere have been described by different researchers in different ways, with varying descriptions of the symptoms, nature, and mechanisms of these disorders. Some consider this form of aphasia "transcortical sensory aphasia"; others, "conductive"; others, "amnestic" or "acoustic-mnestic" aphasia, and associate its occurrence with memory impairment.

At different times, various hypotheses were put forward regarding the nature, mechanisms, and syndrome of speech impairment in this form of aphasia. The greatest attention was paid to the pathology of repetitive speech, since, at one time, the impairment of this symptom was proposed as the sole symptom. The classics of neurology, who studied this phenomenon of repetitive speech impairment, proceeded in their assessment of the mechanisms of aphasia and its individual symptoms from the associationist ideas in psychology that prevailed at that time, and believed that repetitive speech impairment in the case of damage to the left temporal zone occurs due to damage to the conductive pathways between the sensory and motor centers (hence the name - "conductive" aphasia).

Modern ideas in psychology and neurology have made it possible to approach the assessment and analysis of these phenomena from other perspectives. A. R. Luria showed that the basis of speech disorders in this form of aphasia lies in defects in auditory-speech memory. He also demonstrated that the physiological mechanism of speech disorders - repetition, comprehension, the emergence of verbal paraphasias, contamination, etc. - is an increase in pro- and retroactive inhibition of weakened auditory-speech traces, as well as the phenomenon of equalizing the intensity of traces.

Above was described an entire cycle of studies, which not only confirmed the reality of this form of aphasia. We put forward and proved the hypothesis of its polyfactorial nature, and that auditory-speech memory is not a factor in this aphasia and its weak link, and two factors were also described: 1) a violation of the volume of acoustic perception (and not memory); 2) a violation of visual images-representations.

However, many aphasiologists and practitioners still do not distinguish this form of aphasia. Some of them confuse it with sensory aphasia, others consider it a stage in the development of sensory aphasia, and still others remain at the level of the old classical ideas about this form of aphasia as a conductor.

The process of understanding, and in particular the understanding of speech, has long attracted the attention of researchers from various fields of knowledge, in particular psychology. However, the question of the psychological structure of these complex mental processes related to the pathology of understanding, as well as their pathophysiological and physiological mechanisms, remains open.

The process of understanding speech is not a mirror reflection of the utterance or text being read, but is always the transformation of this utterance into abbreviated schemes at the level of internal speech, which can then be expanded into utterances. The process of understanding speech is the separation of essential moments or essential meaning from the flow of information. Understanding speech includes the active use of language.

According to the generally accepted view, understanding speech (utterance) is ensured by understanding words and their connections, as well as the connections among sentences and paragraphs. A word consists of individual sounds that acquire meaning in the process of communication. To understand a word, first of all, analysis and synthesis of the sounds that make up its composition are necessary, which consists of comparing the phonemic basis of perceived sound complexes and inhibiting insignificant sound features. Understanding the meaning of a word in a phrase depends on the logical-grammatical connections that it enters into in a phrase. This link in the structure of understanding speech provides for the recoding of logical-grammatical constructions into units of meaning. Understanding logical-grammatical structures is a

complex analytical-synthetic process that includes comparing words in a phrase, highlighting the meanings of words and their combinations within a phrase, inhibiting insignificant impressions, and highlighting the system of relations hidden behind certain grammatical constructions. All this is possible only if short-term and long-term memory are included in the process of understanding.

The practical implementation of this process occurs not at the level of individual words, but at the level of sentences and text. Understanding individual words is subordinated to a more general task - understanding the entire statement. Context plays a significant role in understanding both individual words and sentences. "A word acquires its meaning only in a phrase, but the phrase itself acquires meaning only in the context of a paragraph, a paragraph - in the context of a book, a book - in the context of the author's entire work."

A word, in different contexts, can easily change its meaning and significance. Understanding a word in an utterance always involves the process of selection, highlighting some meanings and inhibiting others; this is what O. N. Sokolov means when he writes about the differentiation of individual word meanings under the influence of the text's overall meaning.

However, in addition to the side of understanding speech, which is expressed through the meaning of words and their combinations in a sentence, as well as through the meaning of sentences that make up the whole utterance, there is another integral side of speech activity - this is the motivational sphere, which determines the attitude of the individual to the subject of the utterance or to the person to whom the speech is addressed, and gives this or that meaning to the generalized phenomenon. Understanding the meaning makes special demands on the subject who perceives speech, and proceeds at a higher level.

Thus, the psychological structure of the process of understanding speech is complex, and its analysis cannot be limited to considering only the interaction among the three mentioned links. Full understanding of speech can be ensured by the close interaction of the two aspects of speech, one of which decodes direct information about the actual

objective content of the message being presented, and the other provides a deeper penetration into the essence, into the meaning of the message.

Some researchers have drawn attention to two aspects (or levels) of the structure of speech understanding. This issue was addressed by N. G. Morozova, who identifies two distinct plans in the speech process that are interconnected but not identical. One plan is a speech message about facts or phenomena of life, which may or may not require further independent inference, but in either case does not go beyond the actual content of the oral or written message. This speech plan, expressed in the meaning of words or their combinations, that is, in language categories, is conditionally called by the author the "message plan". Another plan of speech, which lies behind this factual content, reflects a personal, somehow motivated attitude to what is said or described, that is, it reflects human motivations, a person's attitude to facts as to events that play a particular role in his life. This plan of speech - the "plan of meaning" - is expressed through a special stylistic construction of language means and their special intonational and facial coloring, which is perceived during listening or mentally reproduced during reading. Thus, understanding can be very unequal. Understanding facts, and even drawing conclusions from them, is not yet a complete understanding. This is only an understanding of the plan of meanings. It may be sufficient in some cases (for example, an educational text or simple information), but completely insufficient in others. Understanding the plan of meaning depends primarily on the subject's level of linguistic development; understanding the plan of meaning depends on the subject's level of personality development.

Linguists also distinguish two levels in the structure of speech. In their terminology, the linguistic level corresponds to the meaning plan, and the psychological level of speech understanding corresponds to the meaning plan. The assumption of a two-level structure of the speech understanding process, in our opinion, does not fully reflect modern ideas about the interaction and interdependence of such characteristics of a word as its sound and expression, its semantics (meaning, sense, subject relation). Sounding and expression, understanding and pronunciation of a word (speech) are ensured only if there is interaction with the two above-described levels of speech understanding, another level - the sensorimotor level, which is, as it were, the

psychophysiological basis for the organization of the speech understanding process. I.M. Sechenov wrote about the role of the motor component in the acoustic perception of speech and its understanding, and this idea can be traced in the studies of the L. Chistovich school. Our experimental data and data obtained in practical restorative training best confirm this position.

Thus, in our opinion, the structure of understanding can be represented by four interacting levels of its organization. The psychological level provides motivation for speech perception, general orientation in the material, speech activity, and a low-level understanding of the perceived material (verbal and non-verbal), understanding of the actual content, the thought embedded in it, etc. Here, attitudes towards the message, understanding of verbal and non-verbal meaning, attitudes towards interacting with people around them, etc., are formed.

The linguistic (lexico-grammatical) level provides understanding of the subject content at the level of meaning. This level includes: 1) the link of sound discrimination based on differentiated perception of phonemes; 2) the link of operational auditory-speech memory; 3) the link that ensures the recoding of the logical-grammatical organization of speech, that is, grammar, into meaning.

All this becomes possible at the sensorimotor level of perception and understanding, which includes links to kinesthetic and acoustic analyses of sounds and words, as well as their kinetic organization. And again, the psychological level, the task of which is already the formation of understanding of meanings. The process of understanding begins with the acoustic perception of speech that sounds, that is, with the sensorimotor processing of sounds, words; then the received material is processed at the linguistic level, where the actual understanding of speech occurs, and at the second, higher, psychological level, its clarification and isolation of the essence, meaning are ensured. All four levels interact and influence one another in a certain sequence, not always in an exact one, but the presence of all levels of processing of acoustic material is necessary for its complete and accurate understanding. In an adult, the structure of understanding, as ultimately the structure of other mental processes, is simplified due to the transition to the reserve fund of certain levels in the structure of the mental

process, which accelerates the course of the process, but does not affect its accuracy. Speaking about the complexity of the structure of the process of understanding speech, it is impossible not to note once again that understanding speech is not a mirror reflection of verbal information, but the result of the active activity of the subject in analyzing the incoming information. Active activity begins at the first psychological level and manifests itself in orientational and research activities in the perception and general understanding of what is heard, in the formation of motivation for activity, and in the emergence of interest.

Many researchers have pointed out the connection and dependence of language understanding on human activity (Goldstein et al.). To understand, wrote K. Goldstein, it is not enough to listen; one must act, to separate the essential from the inessential (Goldstein, 1948). Human activity, as well as the motivating sphere of his consciousness, which includes needs, interests, and emotions, is a necessary condition for the completeness of language understanding. As for the means of understanding speech, a significant role belongs to the intonational and mimic components of speech. Many researchers believe that the intonational and mimic coloring of words is mentally reproduced during reading and that this is facilitated by stylistic techniques, as well as punctuation marks.

The role of emotional subtext in understanding and expressing speech has been discussed in the works of other authors. In particular, V. E. Syrkina assigns a certain role in understanding speech to the emotional side of the text and subtext. The author identifies some means that ensure a full understanding of the meaning of the message: intonation-mimic (raising and lowering, strengthening and weakening of the voice, tones, rhythm, pauses, etc.) and stylistic (choice of words, combinations of words and sentences, context). True understanding of language is achieved not only by knowing the verbal meaning of the words that make up speech; a significant role is also played by the interpretation of expressive moments of speech, intonation, facial expressions, gestures, etc., which reveal the inner meaning. For example, M. I. Zhinkin believed that there are expressive intonation subtexts that are crucial for interpreting the meanings and meanings of statements. Intonation, as is known, lies at the origins of

speech formation; the process of speech formation in children begins with it (R. V. Tonkova-Yampolskaya).

In the clinic of brain lesions, one or another level and one or another link in the process of understanding speech may be impaired, depending on the topic of brain damage. Understanding speech will be impaired in any case, but each time for different reasons; therefore, the tasks and methods of restoring understanding speech will be different each time, but they will always correspond to the mechanism and structure of the defect.

There are three forms of aphasia, where the primary defect is a violation of speech understanding, and the secondary one is a violation of oral expressive speech: sensory, acoustic-mnemonic, and semantic.

4.9 Language repetition and comprehension disorder. A new approach to the classification of aphasia

In several other studies aimed at clarifying the mechanisms of speech impairment in acoustic-mnemic aphasia, the impairment of speech repetition in this form of aphasia was examined. Modern psychology considers word repetition a complex mental process in which not only auditory perception and articulation are involved, but also the understanding of the word's meaning. Naturally, such a complex mental process cannot be localized to a single brain region, the lesion of which would impair it. It is now known that repetition is impaired in cases of damage to many areas of the brain, and this symptom is included in the syndromes of not one but several forms of aphasia. However, the structure and mechanisms of this process impairment vary each time and depend on the location of the lesion and the form of aphasia.

In our studies, we examined the repetition of individual sounds and word series, taking into account three parameters: word length, phonetic complexity, and frequency. The possible influence of the sound discrimination process disorder, articulation defects, or memory difficulties was also taken into account.

The results of the study showed the influence of the word length and its frequency on repetition accuracy in patients with acoustic-mnemonic aphasia. An increase in the length of a word, on the one hand, and a decrease in its frequency, on the other, led to a violation of the repetition and understanding of the word. The most significant factor for the repetition and understanding of the word was its length. Frequent, but long in composition words in 90% of cases (in 27 of the examined) were not understood by the patients and repeated with errors. At the same time, it turned out that the repetition disorder in motor aphasia is associated with defects in the selection of the necessary articles or their sequence in the word. The repetition process is disturbed here at the "output"; therefore, even in cases of complete impossibility of repeating words, patients do not have a violation of their meaning.

In sensory aphasia, repetition errors were associated with defects in the "input" process, specifically in the sound discrimination link, which is disrupted by phonemic hearing deficits. These defects, in turn, lead to defects in repetition and comprehension.

As for the structure of the disorder, the experiments showed that, in the violation of repetition and comprehension of speech in acoustic-mnemic aphasia, the perceptual link in the structure of these processes is of primary interest: the elimination of possible difficulties in pronunciation, memorization, or sound discrimination did not lead to success. These data allowed us to conclude that repetition defects in these cases are a consequence of the unformed perceptual sound image of the word. This is evidenced by the fact that in all cases where there were repetition errors, there was a misunderstanding of the meaning (sense) of this word. All this confirms the presence of repetition disorders at the initial (first) link.

We attempted to organize the perception of the word to improve repetition and comprehension. The organization of perception was directed towards reducing the volume of perception per unit of time, that is, the word was broken down into parts available for perception and repetition, with subsequent repetition of the word (or series of words) in its entirety. Multiple repetitions of the same verbal elements (sounds, syllables, words) did not lead to their inhibition, but, on the contrary, created favorable conditions not only for the direct repetition of a word of any length, but also for

understanding its meaning and for its actualization after a certain time, that is, for transferring the word (or series of words) worked out in this way into long-term memory.

The obtained experimental material was interpreted based on the theory of I. A. Zimnya about the multi-level structure of the process of acoustic perception of speech, in which the first level provides recognition of individual sounds, the second - the level of intelligibility - provides perception of sound combinations, and in a separate case - syllables, the third (highest) - the level of semantic perception, which is carried out in the system of logical meanings and semantic content, this is the final phase of verbal communication of people.

Based on these ideas about perception, we assumed that in the case of acoustic-mnetic aphasia, in which the repetition (imitation) of individual sounds remains preserved, and in some cases even a small volume of series of sounds, short meaningful (and even meaningless) words, words of medium length, the first level of perception, i.e. the level of intelligibility of speech sounds, is not disturbed. The third level, at which perception occurs in the system of lexical meanings and the meaning of words, is not disturbed either. This is evidenced by the fact that the meaning of a word positively influences its repetition. Recognition of a word's meaning, with the correct repetition of only the first two or three sounds, often led patients to actualize the sound composition of the entire word and to its correct repetition. Nonsense words of medium length were not repeated by patients at all or were repeated with errors. And this is understandable, since the repetition of nonsense words in the case when the subject did not give them subjective meanings occurs, as is known, in the form of an exact imitation of the presented acoustic signals. Imitation requires clear perception, that is, the joint work of the first two levels of perception - recognition and legibility.

On the other hand, we know the symptom of loss of the meaning of a word with its correct repetition, which occurs only in the syndrome of acoustic-mnestic aphasia.

These facts and conclusions are all the more interesting because the use of the same method of reducing the amount of information - words presented for repetition - in patients with motor and sensory aphasia did not give an effect. Moreover, patients with

motor aphasia, when a repetition strategy was imposed on them, which increased the arbitrariness of the speech process, made significantly more errors in repeating and understanding the words presented.

These facts make it possible to offer recommendations for methods to restore repeated speech across various forms of aphasia. If, in the case of acoustic-mnetic aphasia, work on the repetition of speech at a conscious level is necessary (breaking down words and phrases into parts, conscious, arbitrary repetition of them, etc.), then in the case of motor and sensory forms of aphasia, this method is excluded. In these forms of aphasia, special work on repeated speech should not be carried out, especially arbitrary, conscious.

Summarizing our own research described above, we can make a number of important conclusions for the theory of acoustic-mnetic aphasia and the practice of overcoming it:

- the mechanism of impaired repetition and understanding of speech in acoustic-mnetic aphasia is the narrowing of the volume of auditory-speech perception;

- due to the limited volume of perception of verbal information, disintegration of different levels of auditory-speech perception occurs for the second time, which leads to paraphasias and paragnosias;

- the expansion of the volume of perception and the correctness of repetition and understanding of speech are positively affected by the frequency of the word, as well as the special organization of auditory-speech perception, which provides the volume of material available for perception, as well as reliance on auditory-speech working memory.

Thus, these studies show a close connection between aphasia, its individual aspects, and other mental processes, particularly the perception of different modalities and image presentations. They allow us to assess, in a new way, the mechanisms underlying violations of processes such as repetition, word understanding, and word naming in acoustic-mnestic aphasia. These data give neuropsychologists and speech therapists the

opportunity to develop and apply scientifically substantiated methods for restoring speech in aphasia that are appropriate to the nature and mechanisms of the defect.

However, impaired speech comprehension in other forms of aphasia remains insufficiently studied, and the practice of restorative learning still requires effective methods of restoration. In this regard, we have also conducted a number of studies of impaired speech comprehension at the word level (L. S. Tsvetkova, A. A. Tsyganok) and at the sentence level (L. S. Tsvetkova, M. S. Streltsyna) in various forms of aphasia (in 60 patients). The study of word comprehension disorders concerned primarily the most important lexical and grammatical groups - nouns and verbs. The dependence of word comprehension on two parameters of the word was studied: the sound structure (phonemic and motor characteristics) and the semantics (meaning and sense) (Tsvetkova).

The experiment revealed a violation of word-level speech comprehension across all forms of aphasia. The analysis made it possible to establish three types of errors:

Words were presented to the hearing-impaired and selected based on phonetic complexity, length, and frequency.

a) gross alienation of the meaning of words (type I);

b) errors of sound discrimination - literal paragnosia (type II);

c) semantic errors - verbal paragnosia (type III).

The experiments showed that violations of the speech comprehension process had specific features, depending both on the primary defect underlying each form of aphasia and on the level of word organization violated. Understanding of noun words is more severely impaired in sensory aphasia, which is expressed in an increase in the time of understanding and in a high percentage of errors. Words that are close in meaning are very difficult to understand, and the percentage of errors by the type of sound proximity is also high. The next most pronounced degree of impairment in understanding word meanings is acoustic-mnemic aphasia. Here, errors by the type of semantic proximity also prevail. The percentage of errors by the sound type is lower than in sensory aphasia. In semantic aphasia, difficulties are found in understanding

only those words that are close to each other in meaning. Defects in understanding the meanings of words are also found in motor forms of aphasia.

These studies have shown that in the case of motor aphasias, speech comprehension is impaired both in the sound discrimination link (in the case of afferent motor aphasia) and in the links of word selection from various alternatives within the semantic field and in the link of recoding logical-grammatical constructions into units of meaning and sense. The most grossly impaired understanding of the meanings of individual words is in patients with the effect of rent motor aphasia. The phonetic structure of a word affects the understanding of simple, frequent, subject-related words; understanding of words distant in sound composition, in both forms of aphasia, is significantly higher, both quantitatively and qualitatively, than the understanding of the meanings of words consisting of homophonic and oppositional sounds. The influence of the parameter of the phonetic structure of a word on its understanding is especially clearly manifested in afferent motor aphasia. Difficulties in pronouncing words are associated with the complexity of a word's phonetic structure, which leads to a breakdown in understanding.

In patients with efferent motor aphasia, speech comprehension defects are manifested mainly in impaired comprehension of generalized words. The system of connections behind the word narrows and acquires a specific-situational character, which leads to defects in understanding their meaning and sense (for example, patients with efferent motor aphasia attributed to "transport" a steamship, train, trolleybus, helicopter, wheelbarrow, skis, sled, wheel, traffic light, etc.). With afferent motor aphasia, the opposite picture is revealed. Here, the meaning of the word is expanded. The meaning of generalized words in these patients loses its clear categorical boundaries; as a rule, semantic fields expand (for example, patients attribute to the word "transport", in addition to adequate words, a cart, a horse, and a tractor). In these forms of aphasia, the grammatical structure of speech is also disturbed, and agrammatism specific to each form of aphasia occurs, i.e., the linguistic level of speech is also disturbed secondarily (Tsvetkova).

It also turned out that in all forms of aphasia, the understanding of words denoting action, i.e. verbs, is disturbed more severely than noun words. The fact that the degree of disturbance in the understanding process is different in different forms of aphasia (with the same degree of severity of the aphasia itself) also seems important.

A comparison of the number of errors made showed that the most severe defect in understanding words was found in sensory aphasia (58%), acoustic-muscular (34%) and afferent motor aphasia (23%). The severity of understanding disturbance in another group of aphasias looks completely different: dynamic - 11%, efferent motor - 15%, semantic - 15.6%. Qualitative analysis of errors revealed that the leading error in all forms of aphasia is a semantic error. However, depending on the form of aphasia, either errors of sound discrimination, manifested in literal paragnosias, or substitution of words for meaning - verbal paragnosias, come to the fore. Here are tables of the distribution of errors by forms of aphasia.

Form of aphasia	**Number of type II errors (%) (based on two studies)**
Dynamic	0,0
Semantic	0,5
Efferent motor	3,0
Afferent motor	5,3

As shown in Tables 1 and 2, all forms of aphasia are clearly divided into two groups. The first includes dynamic, efferent motor, and semantic forms of aphasia; the second includes afferent motor, acoustic-mnemonic, and sensory forms of aphasia. It is also evident that the most severe impairment in word comprehension is manifested in aphasias of the second group. A significant percentage of this group of aphasias is made up of errors in sound discrimination (literal paragnosias). These data give grounds for concluding that speech comprehension is impaired in the second group of aphasias in the sound discrimination link due to defects in either acoustic (due to impairment in one case of phonemic hearing, and in the other - due to narrowing of the volume of perception and impairment of auditory-speech memory), or kinesthetic analysis of sound at the sensorimotor level of organization of the understanding process. Secondly,

comprehension defects arise at a higher level, at which the selection is not of a sound, but of a word from a series of words of the same semantic field.

Form of aphasia	Number of type II errors (%) (based on two studies)
Acoustic-mnestic	6,5
Sensory	19,0

With regard to the other (first) group of aphasias — dynamic, efferent motor, and semantic — analysis of the errors showed that the phoneme discrimination link, or the sensorimotor level of speech comprehension, is practically undisturbed, but that the disturbance of word selection from the semantic field is clearly pronounced (Type III errors — 10.5%, 10.5%, 14.6%; that is, the number of errors of the semantic type (verbal paragnosias) is ten times greater than errors of the sound type — literal paragnosias). In the second group of aphasias, the difference between the number of Type II and Type III errors is considerably smaller: errors due to semantic proximity predominate by only a factor of two.

Distribution of forms of aphasia by semantic error type

Form of aphasia	Number of type III errors (%) (based on two studies)
Dynamic	10,5
Semantic	10,5
Efferent motor	14,6
Afferent motor	15,3
Acoustic-mnestic	20,0
Sensory	27,0

Quantitative analysis of experimental materials (Akhmetova, Tsvetkova, Tsyganok) provides grounds for the conclusion that different levels of speech comprehension organization are impaired in different forms of aphasia. In the first group of aphasias,

the highest level of speech comprehension organization is impaired - the level of word selection from the semantic field. In the aphasias of the second group, the gnostic level of understanding of the process of comprehension is impaired.

Thus, the data of these experiments first of all showed that speech comprehension is impaired in all forms of aphasia (in particular, in motor aphasias already at the word level), and also made it possible to identify common features of word comprehension impairment inherent in all forms of aphasia: 1) a more pronounced impairment of verb comprehension compared to nouns and 2) the highest percentage of errors in understanding semantically close words. This study provided the basis for making two conclusions that are important for understanding the nature of aphasia: 1) about the predominant violation in impressionistic speech in all forms of aphasia of semantics in the structure of the word comprehension process due to defects in the recoding of the phonetic structure of the word into its meaning as a decisive parameter of speech comprehension disorders in aphasia, but such that has different mechanisms of occurrence, and 2) about the violation of different levels in the structure of comprehension in different forms of aphasia. Studies of comprehension disorders at the phrase level (Tsvetkova, Streltsyna) showed that, in this case, too, semantic type errors prevail, manifested in verbal paragnosias, that is, patients replace one word with another, close in meaning or content. These facts indicate a predominant violation of speech comprehension at the word and sentence levels, due to defects either in the semantic interpretation of verbal information perceived by the patient or in the selection of the desired element from the semantic field during fusion with incoming information. Thus, selectivity at the semantic level is impaired more than at the sensorimotor level when understanding both individual words and sentences in all forms of aphasia, but the mechanisms of impaired comprehension are different in different forms of aphasia.

Summing up our research on impaired speech comprehension in aphasia, we note that these studies have clarified our ideas about the mechanisms of impaired comprehension across different forms of aphasia and have shown that the comprehension process is impaired not only in sensory but also in motor forms of aphasia. Further, despite the fact that the mechanisms of impaired comprehension in different forms of aphasia are

different, they all have in common the prevalence of semantic substitutions, that is, a defect in the selection of a word from the semantic field for various reasons. This semantic error manifests itself at both the word and sentence levels. These data suggest that impaired word selection from the semantic field during comprehension is a common symptom across all aphasias.

It is also important that the basis of speech comprehension disorders in acoustic-mnemic aphasia are two radicals (mechanisms):

- narrowing of the volume of perception, which leads to defects in sound discrimination;

- violation of object images due to the loss of their distinctive features, which leads at the language level to defects in word selection within the semantic field, that is, to semantic errors.

Of considerable interest are the data on the compensatory effect of the psychological speech plan on comprehension in cases of violation of its grammatical design. The compensatory effect of this speech plan (which includes the subjective frequency of the situation, the content stated in the sentence, the recognizability of the situation, its familiarity, the emotional attitude to the content, the connection with past experience, etc.) on the effectiveness of comprehension should be taken into account when developing methods of restorative learning.

It also seems important to clearly divide all forms of aphasia into two groups according to the severity of the comprehension disorder and the distribution of semantic and phonetic errors. All this requires new methodological approaches to the restoration of the comprehension process, which would take into account data on the mechanisms and structure of the violation of the process of speech comprehension.

Of great interest in understanding aphasia are studies that address two important questions: the dissociation between speech and musical processes, and the correlation between the logical-grammatical and rhythmic-intonational components of speech in healthy individuals and patients with aphasia. These two problems were first investigated in the work of A. R. Luria, and later in his joint work with L. S. Tsvetkova.

A. R. Luria wrote that "a significant number of neuropsychological works published in recent decades indicate the dissociation of speech and 'musical' processes. Patients with pronounced speech disorders arising from left hemisphere disorders, which lead to the syndrome of sensory, amnestic, and acoustic-mnestic aphasia, usually retain musical hearing, while in patients with lesions of the temporal parts of the right hemisphere and the syndrome of musical hearing impairment, speech remains preserved."

Of course, the study of cases in which brain lesions occur among musicians is of particular interest. Such a case was presented in our studies, in which speech disorders were described in a composer and pianist with sensory aphasia and elements of afferent motor aphasia. The patient initially had a complete lack of oral expressive speech, and speech comprehension was grossly impaired. Gradually, in the process of restorative training that we conducted, oral speech began to recover - words, individual non-sentential expressions, and emotionally expressive speech appeared.

The patient made significant progress in understanding speech, aided by the neuropsychologist's intense tracking of lip movements. At a certain stage of general recovery, but still with a gross form of aphasia, the patient gained the ability to write - the recovery of written speech outpaced the recovery of oral speech. During this period, the patient sat down at the piano and began performing complex works. And then he began to consult with his students (with our help) and, in the end, he began to write and compose music for the cycle of romances "Native Land" to the words of T. Tvardovsky. This case was studied in detail and described by us. It led us to believe that the brain organization of auditory and musical processes differs. Speech disorders left musical hearing and musical activity preserved.

In the same work with the patient, a dissociation of the restoration of oral and written speech was revealed. It is also interesting that when expressive reading was impaired, the patient's internal reading remained relatively preserved - not analytical-synthetic, but by the type of recognition of the word as a whole. The perception of the line's rhythm and of the poem as a whole was preserved. He conveyed it by swaying his body, tapping his finger, and humming.

The researchers had a question that may be of considerable interest. A. R. Luria wrote on this subject: "... can't the preservation of musical (prosodic) processes be used by patients with aphasia for a certain compensation of speech processes?" The solution to this question could be of significant theoretical and, of course, practical interest. And in one of his works, A. R. Luria showed that resorting to rhythmic prosodic speech can be used as a method of partial compensation for speech defects that arise in the semantic variant of amnestic aphasia.

In this work, they showed, based on many years of work with patient Z, with sharply expressed violations of the actualization of the necessary words and logical-grammatical constructions, as well as a gross violation of the understanding of such constructions, that the patient found a method of searching for and finding the necessary words - this is the way to use "rhythmic prose". The psychological essence of this method was: 1) in distracting attention from conscious word searches; 2) reliance on the patient's preserved automated syntagmatic speech structures; 3) the use, first of all, of the stereotypical rhythmic prosodic structure of smooth speech. The patient's attention, using this technique, began to shift toward constructing a rhythmic-melodic flow, and the search for words, when included in this flow, became automated. The patient created "rhythmic prose". A. R. Luria gives an example of such prose of patient Z, which was a technique for finding the necessary words. "Yes, I don't feel like eating at all, neither bread, nor lard, nor soup - I have lost my appetite for food from my wound like this..." It is easy to see that the search for individual words and complex grammatical constructions is replaced here by the process of using rhythmic-prosodic, "musical" stereotypes, which the patient retained, since he had damage to the parietal zones of the cortex of the left hemisphere. This "method of speech rhythm" has received further theoretical and practical development in our work; it is used in work with various forms of aphasia, in particular, dynamic and acoustic-mnemonic aphasia.

This work and the facts it reflects, as can be seen from its brief presentation, truly prove that there is a "difference in the psychological generation of ordinary 'prosaic' speech, on the one hand, and rhythmized 'poetic' speech, on the other". The described works in the case of both the composer Sh. and patient Z. provide an opportunity to see how the preservation of "musical" (prosodic, rhythmized) elements of speech expression helps

to overcome amnestic speech defects in the case of aphasia in the latter case and to restore oral expressive and written speech in the former. This idea was confirmed and further developed in our experimental studies of dynamic aphasia and in restorative learning. These works managed to show that patients with dynamic aphasia, who completely lacked active spontaneous speech, but retained all forms of reproductive speech, as soon as they were given rhythmic-melodic methods, the method of intonation and tapping the rhythm of a phrase with the help of chips (pieces of cardboard, paper) that bring out the linear structure of the phrase, could immediately speak an entire phrase, and then several phrases and statements.

More details about this will be written in the relevant sections of this book. Here, we wanted to show, first, the differences in the mechanisms of generating "prose" and "poetic" (rhythmized, intonationally "musical") speech, on the one hand, and the different localization of brain damage in lesions associated with these speech characteristics, on the other. Secondly, the logical-grammatical and rhythmic-intonational components of the speech process can play an interchangeable role. Thirdly, speech and musical hearing are localized in different hemispheres of the brain: the first in the left hemisphere and the second in the right. And finally, the invaluable role of the scientific approach to the development of methods of restorative learning and, in general, to the restoration of higher mental functions.

We have completed a very brief review of our new experimental findings in the study of aphasia, which deepens and somewhat changes our understanding of aphasia and its theoretical framework. This material is part of the scientific foundation of HPF recovery and restorative learning.

4.10 Neurolinguistic aspect of aphasia

Neurolinguistics, as one of the methods for analyzing the clinical picture of speech disorders in aphasia using linguistic terms and based on linguistic theories, appeared relatively recently. The formation of neurolinguistics was prepared by the development of neuropsychology and psycholinguistics. The neurolinguistic method for analyzing

aphasia is an auxiliary method during the neuropsychological and psychological study of speech disorders in aphasia.

Aphasia, being a speech disorder as a mental process, is manifested primarily in defects of verbal and non-verbal communication, in changes in the patient's personality and emotional sphere, and becomes the cause of the disintegration of other mental processes, the regulation and organization of which is speech. Therefore, aphasia should be the subject of neuropsychology and psychology and the object of study of neurology, neurolinguistics, and other related fields of knowledge. In recent years, a mistaken tendency has appeared to consider aphasia a subject of linguistics (Critchley, 1974). Neurolinguistics in neuropsychology occupies an important place and is a valid method for studying certain aspects of aphasia. It enriches our knowledge of aphasia, enables the study of the linguistic aspects of speech disorders, and identifies correlations among the psychophysiological, psychological, and linguistic levels of organization of speech functioning and its pathology. However, this method of studying aphasia can only be effective in close interaction with neuropsychological and psychological studies of aphasia. A. R. Luria was one of the first to combine the achievements of modern neuropsychology, psychology, and psycholinguistics in his studies of aphasia. He was the first to give a truly scientific neurolinguistic analysis of disorders of oral speech during aphasia - speaking and understanding - which was based on a neuropsychological analysis of the defect.

The method of neuropsychological research used by A. R. Luria, from the very first works, organically included the latest achievements of linguistics and psycholinguistics. Thus, the theory of phoneme, developed by the Prague School of Structural Linguistics, made it possible for the first time to scientifically explain the mechanism of sensory aphasia, identified by Wernicke in 1874. The mutually enriching cooperation between neuropsychology and linguistics was clearly manifested in the development of the concept of two classes of aphasic speech disorders, associated with the predominant loss of syntagmatic or paradigmatic speech systems. When the anterior parts of the brain are affected (dynamic, efferent motor aphasia), coherent, developed, syntagmatically organized utterances are mainly affected, while the ability to use paradigmatic language codes remains relatively preserved.

The opposite picture is observed in cases of damage to the posterior parts of the brain's speech zone (afferent motor, sensory, acoustic-mnemonic, and semantic aphasia), which primarily causes a violation of the use of paradigmatically organized language code units. At the same time, A. R. Luria noted that both the paradigmatic and syntagmatic organization of language include a number of levels that can be selectively disrupted by brain lesions of different localizations.

The neurolinguistic method of analysis is widely used to clarify the structure and mechanisms of disruption of various linguistic levels of speech (words, sentences, phrases) and to develop appropriate methods for overcoming these defects. A number of researchers have conducted a series of studies on aspects of speech disorders in aphasia using the neurolinguistic method of analysis, particularly lexical disorders, which we will briefly discuss.

A number of our studies aimed to examine the role of grammar in sentence comprehension in aphasia. It is known that, in aphasia, it is often unclear how agrammatism affects speech comprehension and how the grammatical and psychological plans of speech, identified by L. S. Vygotsky, interact in agrammatism. He pointed to the complex interaction of these two plans of speech on understanding thought. Our studies of patients with agrammatism in aphasia experimentally confirmed the existence of psychological and grammatical plans in the structure of speech and their complex interaction (L. S. Tsvetkova, Zh. M. Glotan). It turned out that healthy subjects (experts) in a significant percentage of cases could restore the information embedded in the phrase, that is, convey its meaning, despite the distortion of the grammatical structure, as the analysis showed, due to the compensatory influence of the psychological plan of speech. The dependence of the success of the transfer of meaning on the grammatical complexity of the phrase, on the type of grammatical errors made, and on the length of the phrase was revealed. The positive effect of the redundancy of the grammatical system of the Russian language on the ability to convey the necessary information in various grammatical ways and to compensate for violations of the grammatical plan in aphasia was also established.

Further, the analysis showed that the negative impact of the grammatical plan of speech on the psychological one is most pronounced in efferent motor aphasia, in which the psychological plan of speech is most disturbed. With lesions of the posterior parts of the brain, the psychological plan of speech is relatively more preserved, making it possible to compensate for violations of the grammatical plan of speech.

Since lesions of the anterior speech zone are associated primarily with violations of the syntagmatic organization of speech (R. Jacobson, O. R. Luria), it can be assumed that syntagmatic structures play an important role in the transfer and understanding of the meaning of the utterance.

4.11 Vocabulary impairment in aphasia

The word plays an important role in human speech communication. It is known that the deficit of vocabulary in aphasia and its qualitative disorders (violation of the ambiguity of the word, alienation of the meaning of the word, change in its objective and subjective frequency, violation of grammatical functions, etc.) is one of the most important causes of violations of verbal communication in aphasia. The study of patterns of vocabulary violations and the development of scientific foundations for overcoming their effects are important tasks of aphasiology.

One direction in the study of vocabulary violations in aphasia is the study of verb use violations in patients' speech. In the literature on aphasia, the issue of violations of the predicative side of speech in aphasia, and in particular, violations of verb actualization in dynamic and efferent motor aphasias (A.R. Luria, E.S. Bein, L.S. Tsvetkova, T.V. Akhutin, N.N. Polonskaya, etc.) has been repeatedly discussed.

The study of the role and place of the verb in the speech of patients with aphasia is an important problem in aphasiology that has both theoretical and practical significance.

It is generally accepted that the predicativity of language is of paramount importance for constructing an utterance, and the predicate, and primarily the verb, is a constitutive means of a sentence. It is also known that the verb - its use - is disturbed primarily in the case of those forms of aphasia in which the construction of the utterance is grossly

disturbed (dynamic and efferent motor aphasia). However, recently, works have appeared that show that the verb - its understanding and use - is also disturbed in other forms of aphasia. The importance of the question of verb disorders - in which forms of aphasia, how, and why the verb is disturbed - is great not only for clarifying ideas about aphasia, but primarily for increasing the effectiveness of rehabilitation work. The study of these issues became the task of one of the studies (Akhutina, Polonskaya).

It is known from linguistic works that the verb, as the most important lexical and grammatical category in human vocabulary, serves two functions: nominative (naming an action) and grammatical (organizing a sentence). In connection with this dual nature of the verb, we studied the question of how the actualization and use of the verb is disturbed depending on the form of aphasia. We conducted special experimental work, which found that in patients with efferent motor and acoustic-mnemonic aphasia, the actualization of the verb is impaired. However, this disturbance is caused by various reasons. In patients with efferent motor aphasia, the deficits are due to motor defects, pathological inertia, and disorganization of the grammatical aspects of speech. In patients with acoustic-mnestic aphasia, difficulties in actualizing verbs are caused by defects in remembering and selecting words from the semantic field, which may be associated either with a violation of the structure of word search or with a violation of the structure of the semantic field. It was also found that in efferent motor aphasia, the grammatical function of the verb is primarily impaired, and in acoustic-mnestic aphasia, the nominative function. These data clarify and develop the well-known idea of A. R. Luria and R. Jakobson about the violation of the syntagmatic organization of speech due to damage to the anterior speech zone and the paradigmatic one due to damage to the posterior speech zone (Luria; Goldstein).

These data can be considered in general as a structural change in the vocabulary in acoustic-mnemic aphasia, which is manifested in the expansion of the meaning of the word, which leads to the undifferentiation of the boundaries of semantic fields, in defects in the processes of inhibition, in the violation of selectivity, when several words pop up simultaneously, which become equally probable when naming objects, etc. It can be assumed, given these works, that the violation of selectivity within the semantic field during the task of choosing the right word and the violation of the boundaries of

semantic fields are associated with the undifferentiation of the popping-up images-standards, with the elimination of their characteristic features during their comparison with the word, which is one of the mechanisms of the violation of word actualization. If we take into account that the connection of a word with an object is mediated through a concept or image (S. L. Rubinstein), then we can understand the symptoms revealed in this form of aphasia, such as alienation of the meaning of the word provided that it is pronounced correctly, difficulties in naming the object as a result of the disorganization of the semantic fields of words, which arise, in particular, due to defects in the connections of the word with the image and due to defects in the object image itself, as well as due to defects in selectivity that arise in connection with this, in the process of searching for the desired word or understanding the meaning of the word, subject, subject, subject, subject, subject, subject, subject, subject. These data also indicate a qualitative impoverishment of the dictionary in aphasia.

What is the frequency of a word in aphasia? Does it change, and if so, how and why? There is no sufficiently clear answer to these questions in the literature, although the question of the frequency of vocabulary in aphasia is important both for rehabilitation practical work and for the theory of aphasiology. Until now, the vocabulary taught to patients has been selected without taking into account the word's frequency, which is an important characteristic of a word's communicative richness. Knowledge of this issue will allow the development of scientifically based lexical material, the use of which will increase the effectiveness of remedial learning.

We were the first in aphasiology to study vocabulary from the perspective of its frequency in aphasia (together with Kolikova). Our experimental study of objective and subjective frequency in healthy subjects and in patients with acoustic-mnemonic and motor forms of aphasia made it possible to compile a subjective frequency dictionary reflecting the structure of the passive speech stock in patients with aphasia and in healthy subjects (the selection was made from 472 words), and an objective (active) dictionary based on oral stories on free and given topics. The analysis of the lexical material of both dictionaries showed the following:

1. The proportion of high-frequency words in patients with aphasia is sharply reduced compared to the speech norm for both the active and passive stock.

2. The high-frequency vocabulary of the passive stock in patients is sharply reduced due to an increase in the percentage of low-frequency words and especially the layer of "neutral" frequency.

3. The active lexical dictionary, identified from the materials of spontaneous speech in patients with aphasia, is characterized by great qualitative uniformity compared to the norm.

These data indicate a narrowing of the vocabulary of patients with aphasia and a decrease in the proportion of high-frequency words in it, which patients subjectively perceive as lower in frequency, as well as a qualitative impoverishment of the vocabulary in aphasia.

In patients with aphasia, in contrast to healthy subjects, an unsystematic decrease in vocabulary frequency was found: they often evaluated words that are equally often encountered, whether rarely or frequently encountered, and whether well-known or little-known. Abstract vocabulary was the most underestimated.

The reduction of high-frequency vocabulary and its replacement with low-frequency, or "neutral", the phenomenon of unsystematic reduction of vocabulary in the passive dictionary may underlie the disruption of the automated process of word actualization in spontaneous speech and its replacement with an arbitrary and conscious search for words, which occurs in the spontaneous speech of patients with motor and acoustic-mnestic forms of aphasia.

In connection with the obtained data, the question arose, due to which quality of the vocabulary, there is a quantitative reduction in the proportion of high-frequency words in patients with aphasia? For this purpose, we attempted to identify factors that influence the subjective assessments of the frequency of word use in the norm. We noticed that the frequency of any lexeme of an individual speech dictionary is determined by some semantic and extralinguistic factors, among which we identified:

1. The personal factor (level of development of the individual, his education, gender, age, occupation, hobbies, inclinations, etc.).

2. The axiological factor (degree of socio-cultural and individual significance (value) of the reality denoted by this word).

3. The factor of the subject's awareness of the scope of the concept and meaning contained in this lexeme.

4. The emotional factor.

5. The spatial factor (degree of remoteness - proximity, "accommodation" of the reality denoted by the word).

6. The factor of "familiarity", closely related to the factor of occurrence, which is determined by the frequency and intensity of the subject's operations with this real and ideal object.

Taken together, these factors make it possible to identify the characteristics of the highest- and lowest-frequency vocabulary of native speakers of a given language. Thus, healthy native speakers include words that denote: 1) frequently encountered; 2) well-known; 3) have high value; 4) clearly understood; 5) Realities that have personal importance for the individual; 6) without negative connotation. Accordingly, as the specific weight of these factors decreases, subjective assessments shift towards lower frequency.

The dependence of subjective word assessment on extralinguistic characteristics differs qualitatively between the norm group and the group of patients with aphasia. For healthy subjects, almost all of the listed factors are important. For patients with aphasia, the most significant factors are the word's occurrence, familiarity, and emotional coloring.

A comparison of the subjective vocabulary of healthy people and patients with aphasia showed that the maximum agreement in the evaluations of nouns in both groups of subjects is manifested in the field of concrete vocabulary of various categories, in the extralinguistic characteristics of which the greatest specific weight falls on the share of the factor of "familiarity" and "frequent occurrence" of the object. These are concrete

words denoting everyday objects (tea, matches, plate, towel), clothing (dress, pants), body parts (head, arm, leg), furniture, furnishings, and parts of the room (window, tap, sofa).

With the removal of objects from individuals' perceptual field (spatial factor), the subjective assessment of healthy subjects decreases in direct proportion to the object's remoteness. Patients with aphasia reduce the assessment of frequency in an unsystematic manner. For example, when evaluating words of the semantic field of flora and fauna, healthy subjects consistently lower their scores from high (for animals and plants found in the city) to low (for rare, exotic objects). Patients with aphasia mix up the spheres of occurrence in their assessments, including words denoting urban, rural, and exotic flora and fauna with equal frequency.

These data provide a completely new perspective on lexical disorders in aphasia, which makes it possible to approach the understanding of aphasia and methods for overcoming it from a different perspective. In this study, which is very important, we experimentally approached the issue of the preservation or violation of the chronotope in aphasia.

Thus, the study of vocabulary in aphasia showed that in all forms of aphasia, the word is disturbed as a system of multidimensional connections, and its internal constructive unity, the unity of its various plans - expression, sound, and meaning - also collapses. It is also disrupted as a focus of connection of lexical (extra-linguistic), grammatical meanings, and subject-relatedness, primarily the semantics of the word, and the word is also disrupted as an element of the semantic field. These structural defects of the word are directly dependent on the form of aphasia, that is, on the primary mechanism of its occurrence. This leads to a violation of various functions of the word - lexical, grammatical, etc., and primarily to defects of the communicative function of speech.

The newly published literary data on speech disorders in aphasia make it possible to clarify and deepen understanding of the mechanisms of aphasia, its psychological structure, its relationship with other mental processes, as well as the role of image-representation in the formation and overcoming of aphasia, etc. These data enrich the understanding of the psychology of speech, indicating the complex interaction of

speech with a polymodal image, and give reason to believe that a word has not only different ways of encoding - verbal and figurative - but also that they are mutually dependent.

The new experimental material from the study of aphasia presented above, and the material obtained by us in later years (1990-2000s), gave reason to say that aphasia is not only, but also not so much, a speech disorder, but also language, as well as HPF, interconnected and mutually conditioned by speech. This is a complex and heterogeneous pathological formation that arose from speech compensation. It is heterogeneous both in the mechanisms of occurrence and in psychological content. This is a multi-level structure of the formation and is the cause of the disintegration of all human mental activity, which appears in different forms depending on the level and topic of brain damage. Such a new understanding of aphasia also requires a new methodology for its study, which should approach it from the whole to the part, with an understanding of its multi-level structure.

4.12. Conclusions. General methodological recommendations

These new data on aphasia allow us to consider it, firstly, as a systemic disorder of speech itself, which occurs with organic brain lesions, covering different levels of speech organization: psychological - sensorimotor and semantic; linguistic - word, sentence, text; different levels of its implementation - arbitrary and automated; all its forms and types. Secondly, aphasia should be considered in close connection and interaction with other HPFs, primarily with perception, object images and concepts, memory, thinking, etc., since aphasia leads to the disintegration of the entire mental sphere. Aphasia and its manifestations depend on the patient's emotional-volitional sphere, personality, and personal reaction to the defect. Aphasia cannot be considered only as an isolated speech defect, outside its connection with the entire mental sphere, the state of which affects the degree of severity and form of manifestation of aphasia, as well as the effectiveness of its overcoming. Aphasia is a multifactorial phenomenon, which contains in its structure at least four components: 1) a violation of speech and language itself; 2) a connection with a violation of other mental processes; 3) a change

in the personality, its structure, self-awareness, and self-perception, and its connection with speech; 4) a personal reaction to the defect.

Thus, having briefly clarified the psychological content of aphasia, we can give the following working definition. Aphasia is a systemic speech disorder (and, in some cases, language) that occurs with organic brain lesions of various localizations, which is why its various forms arise. Aphasia encompasses different levels of speech organization and execution, is associated with other mental functions, leads to changes in the patient's personality and to the disintegration of the entire mental sphere, and is manifested primarily in the violation of the communicative function of speech.

Restorative education should proceed from this definition, and its methods should be directed not only to speech itself, but also to other mental processes related to speech and to its social aspects.

We see that these new data, briefly outlined, provide the basis for a new construction of restorative education and the development of adequate technologies for overcoming aphasia. When analyzing aphasia and determining methods for overcoming it, it is necessary to proceed primarily from the level of the construction of this complex pathological formation. Methods of restorative learning and, in general, neuropsychological rehabilitation of patients with aphasia should correspond not only to the form of aphasia, but also to the level of its organization that has been affected, to the degree of speech impairment and other HPFs, and to the personality and emotional-volitional sphere of patients.

The data obtained became the basis for the development of a number of new methods of speech restoration in the case of aphasia (nominative function of speech, object-relatedness of the word, understanding of speech, etc.), aimed primarily at the restoration of object images - their accuracy, richness, mobility, on the one hand, and at the restoration of the speech organization of object images - on the other.

Further, during the restoration of understanding of sound speech, it is necessary to organize its perception: narrow the volume of the presented material, reduce the pace of presentation, and, while relying on semantics, increase the order of perception.

1. This became possible because it was shown that acoustic-mnetic aphasia is primarily associated with defects in the process of perception of visual and acoustic modalities and with a violation of object images. A decrease in the volume of perception of verbal material and its processing per unit of time is possibly associated with defects in the process of perception in the link of iconic memory, established by G. V. Gershuni and A. V. Gershuni. V. Gershuni and A. V. Baru for acoustic signals, which is an earlier stage of classical short-term memory and is structurally included in the process of perception.

It is this memory that is disturbed in acoustic-mnestic aphasia. In the considered form of aphasia, the phenomenon of replacing simultaneous perception with successive one is revealed both during the recognition (understanding) of a sonorous word and during the recognition of visually presented objects. Any type of perception is the result of a combination of simultaneous and successive perception (A. N. Leontiev). In acoustic-mnestic aphasia, this combination disintegration occurs due to a violation of simultaneity.

2. Speech comprehension disorders are manifested not only in sensory, but also in motor forms of aphasia. In addition, it turned out that the most frequent and characteristic error of all forms of aphasia leading to impaired comprehension is the semantic substitution of words. It is especially pronounced in dynamic, efferent motor, and semantic aphasia. In sensory, acoustic-mnestic, and afferent motor aphasia, errors arising from defects in sound discrimination (literal paragnosias) come to the fore.

3. Methods for restoring speech comprehension should take into account these features of impaired expressive speech. First, restorative training for patients with motor forms of aphasia should be designed with a focus on expressive speech. Secondly, training methods should take into account: a) the presence of semantic substitutions (verbal paragnosias); b) impaired ambiguity and frequency of vocabulary in various forms of aphasia; c) violation of object images, etc.

However, the different mechanisms underlying these defects in different forms of aphasia require different methods.

4. In restorative work, new data should be taken into account regarding the violation of vocabulary in the case of aphasia, and first of all, the facts that have shown that the use of the verb in speech by patients with aphasia and its actualization are disturbed in the case of all forms of aphasia. In dynamic and effective motor aphasia, the predicative function of the verb is disturbed, and in all other forms, the nominative function. This means that in restorative training, firstly, serious attention should be paid to the issue of verb restoration, since it is the organizer of the sentence, and, secondly, the methods of overcoming this defect should be different and depend on the mechanism of the defect of "verb weakness".

5. Important for the correct construction of restorative training are also data related to the frequency of the vocabulary of patients with aphasia, and primarily data on the tendency to reduce high-frequency vocabulary and the predominance of vocabulary of medium frequency of occurrence and often low-frequency vocabulary. This means that when working with patients, it is necessary to specifically select the dictionary used for training (and which is directly used). The selection of the dictionary should take into account these features of aphasia. High-frequency words normally cannot serve as the basis for teaching patients' oral speech, but should become its goal.

6. Important for increasing the effectiveness of restorative training are also data indicating a fundamentally different nature of the violation of semantic fields, from which the desired word is selected in different forms of aphasia. This knowledge requires, first, special work to overcome the defect in the actualization of semantic fields and, second, a differentiated methodological approach. Thus, in acoustic-mnetic aphasia, methods are needed that would contribute to the quantitative increase in the field, the removal of impulsivity (jumping) in the transition from one field to another, etc., and in the case of efferent motor and dynamic forms of aphasia, the removal of inertia in the process of actualizing words from semantic fields, etc.

Work on the actualization of semantic fields, on their number and content, is directly related to the restoration of the patients' vocabulary, its activity, and polysemy, and all this leads to the restoration of productive speech, its communicative function.

It is necessary to use in the rehabilitation training of patients the provisions on the difference in the mechanisms of generation of "prose" and rhythmized "poetic" forms of speech and to apply the methods of "rhythmic prose" to restore actualization or finding the necessary words in amnestic and acoustic-mnestic aphasias and rhythmic-melodic and intonational methods ("musical") to restore oral speech in patients with dynamic aphasia.

On the example of new experimental data during the study of aphasia, the necessity and effectiveness of a scientific approach to the HPF defect and to methods of overcoming it, the necessity of studying the defect itself, that is, the nature and mechanisms of its occurrence, its connection with other mental processes, and with the patient's personality, were shown.

Section 5

Venher Hanna

PSYCHOLOGICAL SUPPORT OF THE PERSONALITY OF MILITARY SERVANTS TO SUPPORT THE EMOTIONAL-VOLUME SPHERE IN STRESSFUL CONDITIONS OF TODAY.

5.1. Main Directions of Psychological Support for Military Personnel

Recently, the need for a comprehensive approach to the psychological support of military personnel's personality, aimed at strengthening the emotional-volitional sphere under today's stressful conditions, has become particularly relevant. Modern cultural, economic, and social transformations require a person to undertake an extraordinary mobilization of cognitive, emotional, and personal resources and to be in constant readiness to solve emerging life problems. [15, p.120].

According to the scientific literature [3;5;7;9], we note that psychological support for military personnel is a comprehensive system of measures (training, support, rehabilitation) aimed at developing stress resistance, restoring the mental state and maintaining combat readiness of personnel at all stages of service. It includes the work of psychologist officers, combat stress control groups, decompression after combat missions and mandatory rehabilitation [4, p.123].

The main areas of psychological support: pre-combat stage: psychological training, formation of moral and psychological readiness and will to win. Combat stage: support in the combat zone, control of combat stress, psychological assistance to prevent injuries. Post-combat stage (recovery): decompression, psychological rehabilitation in specialized centers, readaptation to civilian life. Family support: psychological assistance to relatives of military personnel [4, p.100].

Methods and tools: short-term and systemic psychotherapy, techniques of self-control of emotions and autogenic training. Teaching constructive coping strategies (behavior in crisis situations).

Pastoral care and mentoring for the formation of a stable system of values. Creation of psychological assistance points in units

Modern scientists distinguish [4;5;6] coping strategies, an algorithm of behavior in stressful situations. Analysis of scientific literature on the problem of the study showed that the scientific and psychological study of the support of the personality of a serviceman to support the emotional-volitional sphere in today's stressful conditions is

an important issue today, requiring professional training of specialists, future clinical psychologists.

The issues of the manifestation of the instability of the emotional-volitional sphere in servicemen remain open in the outlined problem field.

According to the author [4], the instability of the emotional-volitional sphere depends on support from the family.

In view of the above, the development of an algorithm for working with military personnel can be considered relevant [4, p.123].

The theoretical analysis of psychological support for the personality of military personnel to support the emotional-volitional sphere in today's stressful conditions allows us to conclude that today there is a lack of provision for the rehabilitation process, psychological support by professional specialists.

Analysis of theories and models of stress in military personnel. There are quite a large number of theories and models of stress in military personnel and methods of their classification. The scientific basis on which further research was developed was laid by [393, p.67], who created a conversion model according to which it is possible to reduce the level of stress. Analyzing the proposed theories and models of stress factors in military personnel, we can conclude that modern clinical psychology presents a fairly wide range of studies of stress factors, which, due to the large number of proposed theoretical and experimental developments, is difficult to imagine as a single whole and unambiguously systematize. From the point of view of clinical psychology, changes in the emotional-volitional sphere of military personnel are interesting.

5.2.Theoretical and Methodological Analysis of Psychological Support for Military Personnel

In a number of scientific studies of the emotional-volitional sphere of military personnel, it has been shown that there is a clear structure of emotional experience in various traumatic situations. Thus, the results obtained in the studies [5] reveal the specifics of the stress factors' impact on the military personnel's psyche. According to the scientific literature [3; 4; 5], the level of stress depends on external factors and psychological support from the family. Considering the issue of psychoeducation as a direction of a clinical psychologist with families of military personnel, it is worth noting that psychoeducation is needed today at the first stage of work.

Psychological assistance to military personnel consists of carrying out measures aimed at overcoming the psychotraumatic consequences of the impact of a combat situation on the psyche of military personnel and restoring their combat readiness. The basis of military service and combat readiness is that the main forms of psychological support

in conditions of both peace and war are self-help and mutual psychological assistance. Most experts agree that psychological support is a technology whose purpose is to solve specific tasks determined by the scope of its application. Let us dwell on the issues of psychological support for military personnel. War in the modern world is a comprehensive test of both the material and spiritual resources of states and their armies. However, the decisive factor in the outcome of hostilities remains the moral factor, which is determined primarily by man. These aspects significantly affect the psychological state and combat readiness of military personnel, as well as the magnitude, structure, dynamic processes and consequences of stress disorders. In addition, the growth of the weapon's striking power in modern wars and the associated increase in psychogenic losses significantly affect the likelihood of the occurrence and severity of combat mental disorders. One of the most important tasks of Ukrainian military psychologists is to support the mental health and performance of military personnel, taking into account the relevance of this issue in the current political and military situation. Service in the army significantly affects the mental state of a person. Most military personnel experience psychological discomfort, emotional stress, and anxiety. Such conditions can cause disruption of regulatory mechanisms, adaptation problems, and negative consequences for health and psyche. To further study the impact and significance of a military personnel's psycho-emotional state on their success in professional activities, let's consider the concept of psycho-emotional state in modern psychology. The professional activities of military personnel are always associated with extreme conditions that affect mental stability in different ways. Frequent unforeseen situations, feelings of danger, prolonged emotional stress, and other factors complicate their work. To support the mental health of military personnel, it is necessary to study the impact of psycho-emotional states on their activities and consider various ways and methods of maintaining a positive psycho-emotional state. Therefore, to ensure the effectiveness of military personnel's activities and maintain their mental and emotional health, it is necessary to provide psychological support. Today, there are many opinions regarding people's psycho-emotional states, and scientists approach this topic from two main perspectives. External factors can be classified as socio-political, operational-tactical, organizational-administrative, natural-geographic, material-technical, and temporary. At the same time, internal factors are divided into military-professional, psychophysiological, and moral-political. Psychophysiological factors, which include mental characteristics, satisfaction of basic physiological needs, level of physical fitness, and ability to withstand stress, have important biological significance. Among the psychophysiological influences on servicemen, the type of nervous system plays a key role. In psychology, three types of nervous system are distinguished: strong, weak, and average. Scientific studies show that the escalation of negative factors of combat operations leads to significant psychological disorders that require medical

intervention. Servicemen with a weak type of nervous system (approximately 15%) can completely lose combat capability for a certain time. On the other hand, those with an average type (about 70%) temporarily reduce the activity of combat operations. Servicemen with a strong type of nervous system (also about 15%) are not susceptible to specific psychotraumatic effects even in difficult situations [5. p. 118].

5.3. Psychological Factors of Stress Experience in Military Personnel

It was found that the psychological factors of stress experienced by military personnel can be considered objective or external, subjective or internal, as well as objective-subjective or socio-psychological. It was established that various mental states that arise in military personnel under the influence of psychotraumatic factors significantly affect their combat readiness and behavior. Negative mental states that affect the behavior of military personnel include such states as apathy, fatigue, depression, lack of confidence in themselves and their capabilities, depression or, conversely, euphoria, anxiety, fear or fright, a state of stress and frustration, which leads to panic reactions, a sense of doom and despair, a state of mental shock, etc. Military personnel face unique challenges not only on the battlefield, but also in different phases of their professional careers. Given this, psychological support becomes an important component of supporting their mental health and effectiveness. At each stage of military activity, from training to post-war adaptation, different needs and difficulties arise that require a careful approach. At the training stage, it is important to focus on strengthening the resilience and adaptability of personnel. This involves developing stress management skills and creating a trusting environment in which they can express their experiences. During active service, the emphasis is on maintaining motivation, emotional stability, and the ability to quickly recover from stress. Finally, at the stage of returning to civilian life, veterans often need help in readjusting to a peaceful society. Here, support in resolving post-traumatic stress disorders and other psychological problems associated with the events experienced is important. Thus, psychological support for military personnel requires a dynamic, personalized, and flexible strategy that accounts for changes in needs and circumstances of these courageous people at all stages of their professional activities. Thus, participation in hostilities significantly affects the mental health and psychological well-being of those participating in them. Military service requires military personnel to adapt to new conditions of service and combat activities, as well as social and interpersonal conditions that affect their mental stability and the effectiveness of performing professional duties, which is why psychological support is mandatory in the lives of military personnel. [5. p. 147].

5.4. Specific features of Providing Psychological Assistance to Military Personnel

Today, the war in Ukraine has raised the relevance of the problem of maintaining the psychological health of military personnel to a fundamentally new level. It cannot be denied that participation in hostilities is almost always accompanied by a stress reaction of the body, which can lead to adverse consequences (suicide, depression, etc.) without timely, qualified psychological assistance.

Working today in the Preschool Education Institution No. 17 of Mykolaiv with families of military personnel, it should be noted that due to psychological traumatization, difficulties arise with socialization. The need for consulting and psychotherapeutic assistance to various categories of traumatized persons is growing - military personnel, veterans, and members of their families. In my work, an effective psycho-prophylactic tool is psychological counselling. It should be noted that practical psychologists during consulting work today may encounter several problems, including: the absence of a culture of contacting psychologists in the military consciousness; the predominance of the psychiatric model in working with mental (and even psychological) problems of the individual.

Observing the behaviour of military personnel, one can note the differences that are characteristic of them, which are manifested in mental states, processes, and behaviour. These may include, first of all, increased irritability, a tendency to a bad mood, impatience, increased reactivity, tension, signs of depression, increased fatigue, apathy, anxiety, fear, phobic reactions, feelings of guilt, loss syndrome, aggressiveness, anger, resentment, malice, an exaggerated sense of justice, as well as fixation on losses, difficulty falling asleep, nightmares, tremors, inability to relieve tension, including physical tension, a constant sense of danger, etc. All this often leads to a feeling of pronounced fatigue and lack of energy, suspiciousness, memory impairment, difficulty concentrating, preoccupation with memories of the war, symptoms of post-traumatic stress disorder, adverse personality changes, socio-psychological maladaptation, communication limitations, antisocial behavior, household, medical and family problems, substance abuse, interpersonal conflicts with one's spouse, family members, close friends or colleagues, uncertainty about the future, etc. All such problems can be encountered in the modern psychological space today.

As a result of a person's experience of traumatic mental health events, the following aspects can be distinguished: the first, the one that is on the surface, destructive, expressed, as a rule, in the form of "disorders" associated with trauma and stressors; the second, "growth". It manifests itself when a person can “go through the trauma, survive it.” As a result of such living, the quality of a person’s life also changes, but in

the other direction – everything is now perceived in a new way, views on the world, on oneself, on other people change and become deeper.

Analysis of literary sources concerning post-traumatic stress states of military personnel [7; 8; 9;13] allows us to establish their characteristic manifestations, among which the most common are: thoughts of suicide, which in some cases end in the actual commission of suicide; the need to have a weapon with you and solve problem situations with it; partial or complete loss of the meaning of life, lack of confidence in one's own abilities; depression, pessimism, a feeling of neglect and uselessness; distrust of other people, inability to talk frankly about the war; a feeling of unreality of all those events that took place in the war; the development of a feeling of inability to influence the course of events; inability to be sincere and open in communication with other people; excessive anxiety; subconscious perception that you "died" in the war; an attempt to find an answer to the question: "Why did your friends die, and not you?"; the need to vent anger on someone and show aggression for the fact that you participated in hostilities and for everything that happened there; a constant need for high adrenaline and getting thrills, etc.

When consulting clients, the following issues also arise: physical injuries that servicemen received during combat and the problem of being in captivity, especially those who were subjected to torture and violence. During the consultation, it is sometimes embarrassing for them to talk about this. Raising the issue of the specifics of the relationship between a psychologist and a serviceman client in a situation of providing psychological assistance, from my own experience, I recommend focusing on establishing psychological contact and trust. The issue of trust for military personnel is very important. You should not "press" on the military personnel. An important part of the work at the initial stage is to observe spontaneous, reactive emotions and their changes, depending on the topic being discussed. You should pay attention to the verbal and non-verbal reactions of the military personnel. The psychologist should also take into account the fact that the client may have a weapon on them, because without it, they may lose their sense of security (the experience of survival in dangerous conditions is preserved). At the beginning of the consultation, the psychologist must inform the military personnel about confidentiality. From work experience, the consultation should always begin with memories of positive moments. When concluding the consultation, you can use the following remarks: "I believe that we worked productively today", "If you wish to discuss this or any other question with me, I will be glad to meet with you again…" In psychological assistance, the consultant must always follow the client, not force events. Having a higher status in the relationship, the practical psychologist takes on the responsibility to not abuse power, respect the client's autonomy, to not try to control their life decisions, to not force the

recovery process in order to avoid repeated experiences associated with the client's psychotrauma.

5.5. Model of Emotional Resilience of Military Personnel

It should be noted that contact with traumatized clients can cause negative emotional reactions and traumatic countertransference in the specialist.

Recommendations (communication with combatants):

1. Do not force them to talk about the war.

2. Do not interrupt or stop them when talking.

3. Listen to them carefully.

4. Do not evaluate what you have heard from them.

5. Do not use expressions such as "War is hell", "Yes, I understand", etc. during communication.

6. Do not give them advice without first listening to them carefully.

7. Before giving advice or a recommendation, make sure that they are not against listening to it.

8. Do not tell the client that they do not feel something.

9. Do not compare the client's experience with your own experience.

10. Do not suppress the client's feelings, but guide them in the right direction [8].

When designing a consultative space, it is necessary to take into account the psychological levels of maladjustment of servicemen and the phases of the return period. Some researchers distinguish a post-conflict stage, which includes several phases. The first phase is "excitement", which lasts for 2-3 months. This is the so-called euphoric state of servicemen who remained alive. The second phase is a period of "disappointment", which lasts for 8-10 months after returning from the combat zone and is characterized by a rethinking of everything that happened. The third phase of the post-conflict period – "recovery" – appears after the serviceman has not participated in military operations for 10-18 months.

A practical psychologist can actively use exercises to relieve muscle tension, clamps and blocks. Prolonged exposure to stressful situations can lead to the emergence of "muscle armour" in servicemen, which refers to chronic muscle tension that isolates a person from unpleasant emotions when muscles tense, and feelings become dull. The following statements by military personnel are typical: "The body is like a string, and

I don’t feel it”, “When I was wounded, I didn’t feel pain, then I saw blood”, “It’s hard to feel my own body when the guys died”. Relaxing muscles allows you to weaken the muscle armour, get closer to your feelings (relaxation techniques). As an effective means of relieving muscle tension, clamps and blocks, you can use the TRE exercise complex. Frequent consultation requests: help with sleep disorders. Sleep is the best way to reduce the strength of the stress reaction and accelerate its extinction. In consulting work with requests from military personnel, it is important to use the following lines: "What will you do with this next?", "How can you transform this?", "What positive things can this do for you?".

Today, servicemen who have experienced traumatic events may resort to self-destructive behaviour, which is manifested in particular in the abuse of substances (alcohol, drugs). This is one of the most common types of deviant behaviour, which negatively affects both the serviceman's personality and his social environment, primarily family and comrades. The deviant behaviour of a person is a system of actions that contradict the norms accepted in society and manifest themselves in imbalance of mental processes, maladaptation, violation of self-actualization or in the form of evasion of moral and aesthetic control over one's own behaviour.

A useful direction in the work of a psychologist is motivational interviewing. The main components: the client already has everything necessary for change; opening questions are used: “What advantages do you see in …. (variant of changes), “What do you achieve thanks to …..(problem behaviour)?”, support, positive assessment: the skill is aimed at providing feedback, reinforcing belief in one’s own effectiveness and ability to achieve change, increasing awareness of the client’s strengths; reflective listening: involves returning the information that the client about himself and his intentions (thoughts and experiences) in terms of change; summarizing: combining different messages from the client that may not be directly related to each other. Stages of motivational interviewing: 1. Determining the level of person’s motivation for change in general and for continuing interaction with a specialist or visiting a group in particular. 2. The work is aimed at facilitating the person’s decision to change his own behaviour (which involves working with internal and external actions). 3. Psychological support of the client in accordance with the stages of his readiness for change.

The initial stage of motivational interviewing is a conversation about change. It involves studying the initial motivation (desire to change), the orientation towards change, the reasons for this and the client's awareness of the need for change. The next stage of motivational interviewing is planning for change. Developing such a plan is consolidating motivation, its implementation in specific small steps. The final stage of interviewing is setting homework.

Full-fledged rehabilitation of combat veterans, military personnel, their involvement in peaceful life should be considered in the context of stabilizing family relationships. First, it is necessary to get an idea of the state of the family system (quantitative and personal composition of the family, characteristics of relationships between family members).

The emotional-volitional sphere of military personnel is a system of stable mental properties (emotions, feelings, will), which ensure stress resistance and the effectiveness of performing combat missions. It includes the ability to manage emotions, volitional self-regulation, motivation and prediction of actions. In combat conditions, this sphere is subjected to significant loads.

Main components and characteristics: emotional stability: the ability to maintain self-control, control fear and panic, act rationally in extreme conditions; volitional qualities: courage, determination, discipline, perseverance and the ability to self-regulate behaviour. Combat mental traumatization: Traumatic experience is stored as emotional traces of memory that affect the functioning of the personality, creating "traumatic memories".

Features and changes: the impact of combat operations: under the influence of psychotraumatic factors, the sense of security decreases, emotional tension increases and instinctive forms of behavior are activated. Low stability: a low level of the emotional-volitional sphere leads to erroneous decisions, inadequate behavior or refusal to perform tasks. Post-combat period: military personnel who participated in combat operations may experience violations of volitional regulation, depressive states and stress disorders that require psychocorrection.

Formation and recovery: psychological preparation: the use of training and practical exercises to develop resilience. Psychocorrection: the use of special techniques to restore mental balance and correct emotional disorders. Emotional and volitional resilience is a decisive factor that determines the ability of a soldier to act effectively in situations of threat.

Conducting modern combat operations requires a military specialist to have mental stability, confidence in their actions and physical endurance. Of particular importance is the problem of their emotional and volitional stability, which involves speed of action and adequate behavior in various complex and contradictory situations. Nowadays, the majority of military specialists perform tasks related to real combat situations. In these conditions, insufficient development of their emotional and volitional stability, accompanied by significant psycho-emotional stress, leads to erroneous decisions, and in extreme cases - panic, inadequate implementation of tasks or refusal to perform them. In addition, this activity is accompanied by a reasonable risk to their life and health. Prolonged performance of their duties in a stressful

environment leads to maladaptation, reduced body resistance, and neuropsychic overstrain, which results in the development of persistent negative mental states of servicemen. The problem of mental states is one of the little-studied and most complex in psychological science, especially in its applied sections related to professional activity in extreme conditions. This necessitates the study of the announced problem and the consideration of the features of the influence of emotional and volitional stability on the behaviour of military specialists in extreme situations.

The study of current problems of determining and forming professional characteristics of a specialist in conditions of extreme situations was carried out by V. Andrusyuk, V. Varenyk, F. Dumko, V. Yevdokimov, Yu. Irkhin, L. Kazmirenko, L. Kitaev-Smyk, Ya. Kohut, M. Korolchuk, V. Kraynyuk, V. Marishchuk, V. Rozov and others. The phenomenon of emotional-volitional stability was the object of scientific research by N. Babych, V. Vlasov, R. Hasanova, L. Zavarzina, P. Zilberman, S. Kruchynin, O. Tsyganko, etc. These scientific developments are the basis for the study of emotional-volitional stability - an important psychological characteristic of representatives of extreme professions (military personnel, rescuers, firefighters, law enforcement officers, etc.) and its influence on the behaviour of a specialist in conditions of long-term exposure to stress factors.

Studies of the emotional sphere of military personnel can be considered modern with some conditionality, since the scientific history of studying this issue is not long. Certain aspects of the study of the emotional sphere of the military first appeared at the end of the 19th century, when G. Oppenheim, observing participants in hostilities, proposed the concept of traumatic neurosis. A significant increase in scientific interest in this issue occurred with the onset of World War I, when military doctors increasingly began to note disorders in soldiers who had no physical injuries: causeless tremors, significant sleep problems, seizures, etc. Interested in such features, C. S. Myers carefully studied them, outlining the disorders with the concepts of “War Neurosis” and “Shell Shock”. It is worth noting that initially the scientist assumed that the disorders could be caused by the pressure arising from ammunition explosions, that is, he considered the problem exclusively in the physiological dimension. However, he later revised this concept, recognizing that the psychological factor is primary. C. S. Myers proposed two hypotheses that could explain this: 1) the military who received these disorders may have had them before the hostilities or had a certain predisposition to them, and the danger of war became a factor that allowed these disorders to "reveal"; 2) hostilities themselves are a phenomenon that causes traumatization of the mental health of the military, and only their intensity, and not the psychological characteristics of the soldiers, determine the occurrence of 436 disorders. The researcher was unable to finally determine which of the hypotheses had more grounds for confirmation at that time. Analysing the most modern studies, taking into account the contingent of military

personnel that will be studied within the framework of our work, we will further focus on the developments of domestic scientists. Thus, A. O. Kharchenko, studying the participants of the ATO, paid special attention to the differences in their emotional sphere depending on the presence of post-traumatic stress [1]. In particular, in the military, in whom PTSD is observed, destructive concatenation of joy (grief) and surprise (fear and contempt), non-differentiation of sthenic and asthenic negative emotionality, as well as the dominance of such basic emotions as anger, shame, grief and fear are noted. In addition, the researcher showed that the emotional sphere of combatants has its own unique structure, which is manifested in the relative autonomy of such components as asthenic emotions of the negative plan, emotions of the positive plan, morality of emotions and the structure formed as a result of the "sticking together" of negative emotions. A.V. Shidelko says that in general, stress caused by the participation of military personnel in combat operations is an absolute norm, although it can have extremely negative consequences: emotional burnout, deterioration of the emotional state, emotional isolation, and pronounced traumatisation of the emotional sphere. It is very valuable from the standpoint of the tasks of our study that the emotional sphere of the military was studied not only in the context of direct participation in combat operations. In particular, T. V. Makota empirically derived two possible emotional profiles that may be inherent in military personnel: emotionally stable (balance, stability, moderation in emotional response) and emotionally unstable (pronounced emotional lability, anxiety, sensitivity). At the same time, the researcher established that only one-third of the military personnel are carriers of a stable profile. The author also proved that the belonging of a military person to a certain profile determines his psychological characteristics not only in the emotional sphere, but also in self-disclosure, social interaction, predisposition to somatic disorders, etc. N. M. Mas defines the emotional component of the military personality as an extremely important component of military-professional characteristics, which, together with motivational characteristics, under the influence of objective external factors, forms a two-dimensional model of the moral and psychological state of military personnel developed by the researcher [2]. G. Nikitenko, studying mobilised military personnel, came to the conclusion that this category of persons, having no experience of military service, is characterised by alternation of inertness and instability of emotional states (up to involuntary impulsiveness), excitability, and emotional exhaustion. However, with experience, according to G. Nikitenko, in the conditions of contract service without participation in combat clashes, these manifestations of instability gradually disappear. That is, from the beginning, military service can introduce an imbalance into the emotional sphere of the personality, but gradually, provided that there is no real danger, this person is able to emotionally adapt to the conditions of this activity. Viktor Aleshchenko draws attention to the fact that the emotional component is one of the determining factors in each component of the psychological potential of a military

person. In the individual-personal sphere, this is an emotional-motivational attitude towards military activity; in the interpersonal sphere, emotional orientation; in the suprapersonal sphere, group mood; and in the psychoergonomic sphere, stable emotional characteristics [4]. So, we note that the specificity of military activity is manifested across the entire spectrum of the emotional sphere of the personality, and this is true, regardless of participation in combat operations and the term of military service (although the latter factors are determining from the standpoint of the substantive specificity of the emotional sphere of the military). So, when planning our further research, taking into account these facts and the results of the theoretical analysis, emotional phenomena such as 438 differential emotions, mental and emotional states, emotional burnout, and the ability to reflect emotions must be taken into account. Being in a war can be attributed to that extreme situation when a serviceman is in the strongest psycho-emotional stress, while overcoming it with certain willpower efforts. All this comes at a rather high price. Almost everyone who took a direct part in hostilities inevitably experiences corresponding changes in their mental and physical state. International statistics show that every fifth participant in hostilities in the absence of physical injuries suffers from corresponding nervous and mental disorders, and among the wounded and crippled, every third. However, this is only the tip of the "iceberg" formed as a result of the effects of extreme content. The main problems of the military are demonstrative behaviour (50%), fear (57%), suspiciousness (75.5%) and aggressiveness (58.5%). Their main behavioral features include a certain conflict in the family, with work colleagues, relatives, drug and alcohol abuse, and outbursts of anger [1]. All combatants are also characterized by emotional isolation and tension, increased aggressiveness and irritability, causeless outbursts of anger, attacks of anxiety and fear. Recurrent vivid nightmares and dreams of combat situations are noted, intrusive memories of traumatic events accompanied by difficult experiences, as well as sudden emotional outbursts with a "return" to a traumatic situation. Quite often, corresponding thoughts of suicide also arise, which in some cases end with the actual realization of these intentions [3]. All these manifestations, which scientists have called post-traumatic stress disorders, indicate the existence of a corresponding post-traumatic syndrome in combatants. The post-traumatic stress disorder syndrome itself is a specific international name. The following main clinical symptoms are distinguished in post-traumatic disorders of a stressful nature [1]. 1. Excessive excitability manifests itself in the fact that a certain person is quite attentively observing everything that happens around him, and what kind of danger threatens him. This danger is not only external, but also internal. Its main reason is based on a certain fear that the corresponding unwanted impressions of traumatic content, possessing the power of destruction, will break through to the consciousness itself. Quite often, excessive excitability manifests itself in constant physical tension, which does not allow rest and can create a significant number of problems. Maintaining

this high level of alertness requires constant attention and significant energy expenditure. In real life, physical tension performs a protective function (protects consciousness), and it is impossible to completely “remove” psychological defences until the general intensity of all experiences decreases. As soon as this happens, physical tension will disappear automatically [2]. 2. Exaggerated reaction – at the slightest surprise, the person makes rather rapid movements (falls to the ground when he hears a plane flying low enough, takes a fighting pose, turning sharply when another person approaches him from behind, shudders suddenly, starts running, screams loudly) [3]. 3. Emotional blunting. A large number of veterans complain that after traumatic events, it became difficult for them to feel a significant number of relevant feelings. The ability to express emotions is partially or completely lost. Establishing friendly and close relationships with others becomes much more difficult, and love, joy, playfulness, creative upsurge and spontaneity are unavailable [2]. 4. Aggression is manifested in the desire to solve problems with the help of brute force. Quite often this concerns forceful physical influence, but also emotional, mental and verbal aggression. That is, a person is more likely to use forceful pressure on others whenever he seeks to achieve his goals, even if these goals are not vital [1]. 5. Disturbances of concentration and memory appear precisely when there is a corresponding need to directly remember something or concentrate, at least under certain conditions. At certain moments in life, concentration can be excellent, but as soon as a certain stress factor arises, the person concerned directly loses their ability to concentrate [3]. 6. Depression in a state of post-traumatic stress reaches the darkest and most hopeless depths of a person's despair, in a situation when it seems that everything is useless and meaningless. Depression is characterised by apathy, nervous exhaustion and a negative attitude towards life [2].

The emotional sphere is a phenomenon characterised by an extremely complex organisation. In addition to the emotions themselves, it includes such elements as the emotional relations of the individual, emotional properties, tone, states, readiness of the emotional character, emotional self-knowledge and spiritual experiences. In view of this, the emotional sphere requires a clear consideration of influences of various natures, in particular those caused by military activity and combat operations. The peculiarities of the implementation of military activity have an impact on all aspects of the emotional sphere of the individual. It was established that the concept of the “emotional sphere” integrates emotionality, emotional states, needs, motives, etc. The emotional sphere should be understood as a certain characteristic of a person’s individuality, including feelings, emotions, anxiety and self-esteem. The main psychological symptoms of military personnel with post-traumatic stress disorders were established: excessive excitability; exaggerated reaction; emotional blunting; aggressiveness; impaired concentration and memory; depression; general anxiety; fits of rage; drug and alcohol abuse; unwanted memories; hallucinatory experiences and problems falling asleep; emerging thoughts of suicide; "survivor's guilt".

It is of great importance to work on the psychological correction of negative situations in military personnel, especially today, when they are faced with various stressful situations and psychological difficulties. Important points that emphasise the importance of this issue are: War and conflict: participants in military operations and peacekeeping missions face various forms of stress and trauma, which can significantly affect their mental resilience. Adaptation to civilian life: The return of military personnel to civilian life is often accompanied by difficulties in adaptation, which can cause negative emotional states and mental difficulties. Growing need for psychological support: Given new threats and challenges, such as terrorist attacks, it is important to provide adequate psychological support and remediation to overcome negative consequences. Prevention of mental disorders. In-depth study and implementation of psychological correction methods can have a beneficial effect on the prevention of mental disorders in military personnel and the improvement of their mental health. Promoting effective work. Psychological rehabilitation can have a positive effect on the emotional state and mental stability of military personnel, contributing to the improvement of their work and general well-being. Given these issues, research in the field of psychological correction of military personnel is extremely important for the development of effective methods of supporting and improving the mental health of this group of individuals.

The importance of work on psychological correction of negative situations in military personnel is of great importance, especially today, when they are faced with various stressful situations and psychological difficulties. Important points that emphasise the importance of this issue are:

War and conflict: participants in military operations and peacekeeping missions face various forms of stress and trauma, which can significantly affect their mental resilience.

Adaptation to civilian life: The return of military personnel to civilian life is often accompanied by difficulties in adaptation, which can cause negative emotional states and mental difficulties.

Increasing needs for psychological support: in view of new threats and challenges, such as terrorist attacks, it is important to provide adequate psychological support and correction to overcome negative consequences.

Prevention of mental disorders. In-depth study and implementation of psychological correction methods can have a positive impact on the prevention of mental disorders in military personnel and the improvement of their mental health.

Promoting effective work. Psychological rehabilitation can have a positive impact on the emotional state and mental stability of military personnel, contributing to the improvement of their work and general well-being.

Given these issues, research in the field of psychological correction of military personnel is extremely important for the development of effective methods for supporting and improving the mental health of this group of individuals.

Emotional states are complex mental states that arise in response to various events, situations or internal factors, and are accompanied by a certain range of emotional feelings. These states reflect the internal experiences and reactions of the individual to the surrounding world. They are characterised by the diversity and intensity of emotions, which may include joy, sadness, anger, fear, delight, and others. Each emotional state has its own unique dynamics and duration, and can be short-term or long-lasting, depending on the circumstances and individual characteristics of the person. Emotional states can arise both in response to external events and as a result of internal processes, such as reflections, memories, or internal conflicts.

Characteristics of emotional states include the detection of specific emotions, physiological changes (such as increased heart rate, increased or decreased muscle tone), and effects on cognitive processes (for example, changes in perception and attention). Emotional states can be positive, negative, or mixed, reflecting different shades of individual experience [9, p. 165].

The scientific study of the "negative state" is broad and multifaceted, carried out over different periods of time and by different researchers from different fields of psychology. One of the important contributions to the understanding of this phenomenon was made by the American psychologist R. Lazarus (1922–2002), who actively researched the relationship between stress and emotions. He studied the psychology of emotions and stress, where he highlighted the role of perception of events and situations in the emergence of negative emotions, and he is also the author of the concept of "psychological stress", determining that the perception of events that are considered stressors determines the emotional and behavioural response.

The scientist's research proved that the perception of the situation and individual characteristics interact, determining how a particular person reacts to stress. R. Lazarus believed that negative emotions arise not only due to the events themselves,

but also due to the individual's perception of their meaning and importance. His research contributed to the development of the psychology of emotions and stress, taking into account the cognitive aspect in the study of negative states. The scientist pointed out that stress can be a reaction to a mismatch between the demands of the environment and the individual's resources for solving them [15, p. 125].

Research on negative states in psychology has become a key element for understanding and supporting the mental health of people in various life situations. However, scientific approaches to this phenomenon have turned out to be quite diverse and broad, since they take into account both individual characteristics and sociocultural context.

It is important to emphasise that a negative state can arise for different reasons, such as stressful situations, conflicts, traumas, and psychological and physical challenges. Considering this phenomenon through the prism of different approaches makes it possible to understand its nature more deeply and develop effective approaches to psychological support and correction. For example, the concept of R. Lazarus emphasises the role of perception of events and stressors in the emergence of negative emotions. This is important to consider when developing psychological support strategies, since they can be aimed not only at the events themselves, but also at the perception and interpretation of them by individuals. It is also important to consider the deep sociocultural aspects that influence the perception and expression of a negative state. Cultural differences in the expression of emotions and stress management can determine the effectiveness of psychological approaches in different population groups. In light of new challenges and threats, such as a global pandemic or environmental problems, the study of negative states is becoming more relevant for developing practical methods for managing stress, maintaining mental health, and supporting resilience in individuals and communities [42, p. 56].

A negative state in psychological science is a complex and multifaceted concept that encompasses various aspects of emotional, mental, and physiological imbalance in a person. When defining its content, psychologists use various scientific approaches and concepts. The general essence of a negative state is a feeling of discomfort, stress, and negative emotions that can arise both as a result of internal conflicts and under the influence of external events and factors. It is important to take into account individual and cultural differences in the perception and expression of a negative state, as well as its impact on a person’s mental and physical well-being. Systematic study of this phenomenon helps to develop effective strategies for correction and psychological support to preserve and restore mental health [31, p. 95].

The phenomenon of "negative state" in psychology is an important and multifaceted problem, as it reflects a wide range of mental, emotional and psychophysiological states, which are characterised by a feeling of discomfort, stress and uncertainty. The essence of this phenomenon can be understood through several key aspects:

Emotional aspect: Negative state includes a wide range of negative emotions, such as anxiety, stress, irritation, sadness and hopelessness. These emotions can be caused by various factors, from external stressors to internal conflicts.

Psychological aspect: Negative state can manifest itself in the form of mental disorders, such as depression, neurosis, and apathy. It can affect the mental stability and general mental state of the individual, causing problems in their functioning.

Physiological aspect: Negative state can have physiological manifestations, such as changes in the cardiovascular system, hormonal imbalance, sleep disturbances and other physiological reactions associated with stress and emotional tension.

Contextual aspect: The essence of a negative state also depends on the contextual circumstances that cause its occurrence. This can be related to personal difficulties, losses, difficult life situations or professional challenges.

Individual aspect: Negative state has individual differences for each individual, since everyone reacts to stress and emotional difficulties in a unique way. However, it is important to consider that individual reactions can be influenced by genetic, social and cultural factors.

In general, the phenomenon of "negative state" reflects the deep and complex nature of the interaction of emotions, psychology and physiology in the human mental state [43, p. 85].

In addition to the above aspects, it is important to consider the sociocultural influence on the phenomenon of "negative mood". Society and cultural contexts can determine how an individual experiences and expresses their emotions and negative mood. Sociocultural context: The perception of negative mood can vary significantly depending on cultural norms and values. In some cultures, expressing emotions may be considered acceptable, while in others, the opposite is true. Such differences can affect how people understand and express their negative mood. Psychosocial factors: An individual's interaction with their environment, including family, friends, and colleagues, can significantly influence the development of negative mood. Social support, or its lack thereof, can be a key factor in managing emotional difficulties. Cultural construction of emotions: Different cultures may have their own constructions and expressions of emotions. Some cultures may place greater emphasis on expressing emotions publicly, while others may foster a sense of restraint and secrecy in this regard. Cultural and historical context: Cultural and historical events can influence the collective negative state of a community. For example, wars, crises, or natural disasters can cause mass stress and a negative state in society. Considering these aspects allows us to determine the complex nature of the phenomenon of "negative state" and to consider it in the context of cultural realities and social interactions. Such an approach can become the basis for the development of individual and culturally adapted strategies of psychological correction and support aimed at preserving and improving mental well-being [11, p. 123].

5.6. Formation of Strategies for Psychological Support and Assistance

Let us turn to the consideration of scientific approaches to defining the meaning of the concept of "negative state" in psychological science. The term "negative state" turns out to be complex and multifaceted, and its understanding in science includes various theoretical concepts and research. Given this, let us consider the main scientific approaches and their definitions of this phenomenon.

Biological approach: One of the approaches to considering the mentioned concept is based on biological aspects. From this point of view, a negative state can arise as a result of physiological reactions to stressors, which may include changes in the functioning of the nervous system, hormonal imbalance and other physiological manifestations. Scientists studying this aspect are trying to find out how biological mechanisms interact with mental factors and determine a negative state.

Psychological approach: Another approach aimed at studying the mental aspects of a negative state. Here, researchers focus on the emotional, cognitive, and behavioural manifestations that arise as a result of stressors or conflicts. They analyse how an individual feels and reacts to negative situations, how this affects their thinking and actions.

Sociocultural approach: The third approach considers the “negative state” in the context of sociocultural factors. Here, it is studied how cultural norms, the social environment, and collective values influence the formation of a negative state. Researchers analyse how society and its expectations can influence the experience and expression of negative emotions.

Integrative approach: It would seem that the most comprehensive approach is to integrate all of the above aspects. A negative state is viewed as an interaction of biological, psychological, and sociocultural factors.

Researchers working within this approach are trying to find out what specific mechanisms and interactions occur between these different levels of analysis. In psychological science, the phenomenon of "negative state" is studied from different perspectives, which allows for a deep and multifaceted understanding of its nature. The combination of biological, psychological and sociocultural aspects is important for the development of effective strategies for psychological correction and support aimed at preserving and improving a person's mental well-being.

Another important area of research is the psychological stress approach to the definition of a negative state. According to this approach, a negative state is viewed as the body's reaction to stress factors, which can be both exogenous (external) and endogenous (internal). Researchers of this approach analyse the physiological and psychological changes that occur in the body as a result of stress and define a negative

state as a result of these adaptive processes. The Psychosomatic Approach is a research direction that considers a negative state as a psychosomatic phenomenon. According to this approach, a negative state not only manifests itself on a mental level but also affects physical health. Researchers analyse the interaction between mental factors and physiological processes, determining the importance of a psychosomatic approach for understanding the content of a negative state.

Cognitive Approach: The Role of Thinking and Beliefs

The cognitive approach to studying a negative state focuses on the role of thinking and beliefs in its formation. According to this approach, a negative state can arise as a result of negative cognitive representations, stereotypes and beliefs that are formed in the process of perceiving events [51, p. 147].

Thus, it can be stated that the phenomenon of "negative state" reflects the deep and complex nature of the interaction of emotions, psychology and physiology in a person's mental state. Understanding this phenomenon allows us to develop effective methods of correction and support for maintaining and improving mental health.

Negative emotional states in military personnel are a complex and multifaceted phenomenon that arises as a result of the influence of various factors. Research in this area allows us to better understand the nature of these states and develop effective strategies for psychological support for military personnel. Military personnel are exposed to various types of stress, including combat, waiting periods, internal conflicts, and other difficulties. Their emotional mood can be prolonged and unclear, reflecting weakly expressed emotions with considerable duration. Feelings of lack of control and fear can arise during combat, fright and timidity - with real threats. Fear, affective fear, and panic become a reflection of an asthenic state when military personnel lose conscious control over actions. The essence of frustration is manifested in the awareness of difficulties that are difficult to overcome, and stress can arise when realising the complexity of situations. Factors influencing emotional states include the performance of military duties, stressful situations, and psychological and physical difficulties. The use of volitional actions and will can be key to managing emotions and overcoming difficulties [32, p. 93].

Negative states also depend on the social environment, psychosocial factors, and personal characteristics. Anticipation and combat excitement are special emotional states that arise in military personnel in conditions of inactivity and active combat, respectively. Subconscious emotional management is carried out by military personnel of their own will. Factors influencing the occurrence of negative emotions in military personnel include psychological and physiological factors, such as stress, fear, social support, individual characteristics, and cultural context. Understanding these factors is important for the development of psychological support programs and stress

management strategies in military situations. Effective management of these emotional states can determine the mental health and resilience of military personnel during their service [37, p. 142].

The very concept of impact on military personnel is a complex and multifaceted phenomenon, encompassing physical, psychological, emotional and social aspects. Our opinion on this issue is considered from different perspectives: Physical impact: stress and exhaustion: military service, especially in combat conditions, can lead to prolonged physical and emotional stress. Constant readiness for action and high physical activity can lead to exhaustion. Psychological impact: Post-traumatic stress disorder (PTSD): A large proportion of military personnel are faced with events that cause PTSD. This can affect their mental resilience and ability to adapt to civilian life. Ethical and moral conflicts: Solving complex ethical tasks and participating in events associated with suffering and death can cause internal conflicts and affect the psychological state. Emotional impact: Fear and anxiety: The presence of a constant threat to life and health can cause fear and anxiety. This can have a long-term emotional impact on service members, even after they have left service. Bereavement: Grief over the loss of a comrade and a sense of personal responsibility for their safety can trigger profound emotional responses. Social impact: Family relationships: Long periods of separation from family and the instability of the service schedule can affect family relationships and lead to feelings of isolation. Social reintegration: After leaving service, service members may find it difficult to reintegrate into civilian life due to differences in values and experiences. All of these factors interact to create a unique impact on each service member.

Adverse effects on service members are a variety of circumstances or conditions that can lead to harmful or undesirable physical, psychological, and emotional outcomes, contribute to the development of negative states in service members, and can include psychological, physical, social, and military aspects. Let’s look at them in more detail. Stressful situations: Military personnel are often stressed due to the extreme conditions of service, combat, risk to life, and uncertainty about the future. These stressors can trigger negative emotions and states. Psychological distress: Dealing with difficult ethical, moral, or psychological challenges can lead to negative states. This can include situations involving moral conflict, suffering, and loss of comrades. Physical and emotional exhaustion: The physical demands and emotional strain of service can take a toll on the overall health of military personnel, causing fatigue and stress.

Social isolation: Lack of support from family, friends, or other military personnel can lead to feelings of loneliness and trigger negative emotional reactions.

Presence of injuries or losses: Combat operations can cause physical injuries or the loss of comrades, which can lead to the development of post-traumatic stress disorder and other negative conditions.

Adverse service conditions: Poor service conditions, insufficient provision, uncertainty about tasks can cause disappointment and negative emotional reactions [59, p. 84].

Understanding these factors is important for developing effective psychological support strategies and preventing negative states among military personnel. Given the diverse aspects of the impact on military personnel, let's consider each factor in more detail:

Stressful situations: Extreme service conditions: Prolonged exposure to a range of stressful situations, such as combat, can lead to physical and emotional harm. Risk to life: Stress is associated with danger to one's own life or the lives of military personnel. This can cause post-traumatic stress disorder and other psychological problems. Uncertainty about the future: Uncertainty about future tasks and further actions can cause anxiety and stress. Psychological difficulties: Ethical conflicts: Dealing with ethical challenges and conflicts can cause internal stress and negative emotional reactions. Loss of comrades: The death or injury of comrades can cause deep grief and mourning, affecting psychological well-being.

Physical and emotional exhaustion: Prolonged physical exertion: Tasks that require high physical activity can lead to exhaustion and affect the general condition of the body. Emotional stress: Constant readiness to respond to danger can cause emotional stress and exhaustion. Social isolation: Lack of support: Distance from family and friends, as well as lack of support from fellow soldiers, can lead to feelings of loneliness and uncertainty. Difficulties with interaction: Communicating with people who do not understand the military experience can cause social isolation. Presence of injuries or losses: Post-traumatic stress disorder: Physical injuries or awareness of one’s own death or the loss of comrades can cause post-traumatic stress disorder [44, p. 123]. Summarising this material, we can say that the emotional states of military personnel are a complex and diverse phenomenon, determined by the influence of numerous factors. Research in this area provides an opportunity to better understand this problem and develop effective strategies to improve the psychological state of military personnel.

Military personnel experience a variety of negative emotional states that can be caused by stress, fear, frustration, and other factors.

These states can occur both in normal conditions and during combat operations. Not only external circumstances, but also internal factors, such as personality traits and mental stability, have a significant impact on the emotional state of military personnel. It is important to consider that each military personnel is a unique individual, and approaches to regulating their emotional states should be individualised. In addition, understanding the factors that influence negative states can serve as the basis for

developing psychological support and training programs aimed at increasing the resilience of military personnel.

Therefore, given the severity and diversity of emotional states in the military, research in this area plays a key role in the formation of psychological support and support strategies aimed at ensuring mental health and optimising the performance of these professionals.

Psychological literature identifies various ways of providing psychological assistance to a person. One of them is psychological correction. Psychological correction is the process of influencing a person's mental processes and state in order to correct or improve their mental state, emotional well-being and behaviour. The main idea is to correct or change certain negative aspects in the mental functioning of the individual, directing them on the path of self-disclosure and psychological development.

The application of psychological correction can be diverse and focused on different areas of life. This may include working with emotional difficulties, stress, insecurity, as well as correcting some negative mental states or disorders, such as depression, anxiety or phobias. Psychological correction tools may include individual or group counselling, psychotherapy, personality development training, relaxation techniques, art therapy and other approaches. It is important that this process takes into account a person's individual characteristics and focuses on achieving specific psychological goals. Psychological correction is an effective tool for improving the quality of life and ensuring mental well-being [37, p. 50].

Psychological correction, in our opinion, is an important type of psychological assistance aimed at correcting and improving a person's mental state. This approach allows you to adapt and correct certain aspects of mental functioning to achieve harmony and mental health. An important aspect of psychological correction is an individualised approach to the needs of each person. Various methods and techniques are used to work with different aspects of life and emotional difficulties. This may include counselling, therapy, training and other forms of interaction. Psychological correction helps people understand and effectively cope with emotional problems and stress, and also helps in correcting negative mental states. This process must take into account the individual characteristics and needs of each person, creating a supportive and constructive environment for their development. In general, psychological correction is a valuable tool for those seeking help in overcoming emotional difficulties and improving the quality of their lives. Psychological correction in the context of military personnel is a special approach for providing psychological assistance aimed at correcting and restoring the mental state of individuals in military service. This type of psychological support is focused on managing stress, emotional difficulties and mental well-being in the context of military life.

Psychologists who use psychological correction for military personnel and work with various aspects of their lives, such as stressful situations, combat load, adaptation to the environment and interaction in military teams. They use a variety of psychological methods and techniques aimed at improving emotional stability, resolving conflicts and ensuring overall mental well-being.

Psychological correction can include individual or group consultations, stress-resistance training, psychotherapy and other approaches aimed at developing mental stability and optimising the functioning of military personnel in serious situations. Psychological correction for military personnel is important in order to help them effectively cope with the emotional difficulties associated with their service and to provide support in maintaining mental health during the challenges of military life [39, p. 67]. Types and forms of psychocorrection for military personnel may include: Individual consultations: Meetings with a psychologist for private discussions of personal issues and emotions. Group sessions: Participation in group meetings where military personnel can share their experiences and interact with like-minded people. Stress-resistance training: Teaching strategies for effective stress management and increasing resilience to emotional difficulties. Psychotherapy: Systematic therapeutic sessions to uncover and resolve psychological problems. Trauma care: Specialised assistance in managing post-traumatic stress and the emotional consequences of military-conflict situations. Social support: Implementation of support and interaction mechanisms within the military team. These psychological approaches are aimed at helping military personnel overcome stress, maintain emotional well-being, and improve overall mental resilience in the face of their professional challenges. Psychocorrection of negative states in military personnel is a comprehensive psychological approach aimed at identifying, analysing and correcting various negative emotional and mental states that may arise in connection with official or personal activities in the army. The main goal of psychocorrection is to facilitate the adaptation of military personnel to stressful situations, increase their resistance to negative influences, improve the overall level of mental health and support them in harmonious functioning. Psychocorrection includes various methods and techniques, such as psychotherapy, stress resistance training, psychological support, psychoeducation and other interventions aimed at improving the mental state of military personnel. An important part of psychocorrection work is the individualisation of approaches, taking into account the characteristics of each military personnel and ensuring confidentiality [55, p. 100]. The main idea of psychocorrection is not only the treatment of the consequences of negative states, but also the emphasis on their prevention and improvement of a person’s self-regulation mechanisms. Psychologists direct their efforts to create conditions and tools that help military personnel manage their emotions and stress more effectively, strengthen mental protection and promote overall health. In our opinion, the prospects for psychocorrection of negative states in military

personnel look quite promising. On the one hand, understanding and recognising the importance of the mental health of military personnel in the modern world allows the development and implementation of effective methods of psychological support.

Firstly, individual approaches to each military personnel can significantly improve the results of psychocorrection. Specialized programs, developed taking into account the specific needs and challenges faced by military personnel, have the potential to improve their mental well-being. Secondly, integrating psychocorrection into the army culture can open the way for an open discussion of mental health and help identify problems at an early stage. This can help prevent serious psychological problems and help maintain the overall mental well-being of service members.

Therefore, in our opinion, it is unlikely that a universal method can be chosen for everyone, since each service member is unique, and their mental health is determined by various factors. However, psychocorrection approaches aimed at individual needs and taking into account the specifics of military service can be effective in supporting service members and preserving their mental health.

In psychological science, negative states of the personality have become the object of in-depth research, as they affect mental health, social adaptation and the general level of well-being. This topic is revealed at once by several aspects that determine the theoretical foundations of the existence and detection of negative states in people. Negative states of the personality are various indicators of mental well-being and adaptation to internal and external factors. 30 The study of these phenomena occupies a central place in psychological science, where specialists monitor the trends and aspects that influence the formation and development of negative states of the personality. One of the key aspects of the study of negative states is their theoretical models. Scientists consider various theories aimed at explaining the emergence and development of such states. Analysis of the scientific source base allowed us to distinguish the following scientific approaches, representatives of which study the phenomenon we have indicated in detail: the psychodynamic approach (which considers negative states through the prism of internal conflicts and unresolved mental problems); cognitive-behavioral approach (where negative states are considered as the result of negative thought patterns and skills); emotional approach (allows us to consider negative states as the result of emotional reactions to events or situations that affect the personality), etc. However, it should be noted that many theoretical approaches highlight not only the negative, but also the positive aspects of the personality. The polar nature of human mental life makes the study of negative states more voluminous and complex. Psychological literature also emphasizes the role of the socio-cultural environment in the formation of negative states. The study of the influence of the family environment, the educational system, and the social environment allows us to understand how external factors interact with internal

personal factors. The emphasis on theoretical aspects of the study of negative states in psychological science helps to expand understanding of their nature, contributes to the development of effective diagnostic methods, and the development of psychocorrection strategies. Understanding these aspects not only contributes to the improvement of psychotherapy practice but also opens up opportunities for the development of advanced approaches in the study and management of negative personality states.

5.7. Main Areas of Work of a Clinical Psychologist with Military Personnel

We note the main stages and tasks of psychological support for military personnel. According to the regulations and practice of the Armed Forces of Ukraine, the work of psychologists is divided into several key periods: resource psychology and psychotherapy. Before combat operations (training): professional and psychological selection: assessment of suitability for specific types of activities; formation of resilience: training in self-regulation methods and management of combat stress; psychodiagnostics: monitoring the current state of the unit before going on a mission. During the performance of tasks: monitoring the state: identifying signs of combat fatigue or psycho-emotional burnout; crisis intervention: providing first psychological aid directly in the areas of task performance; maintaining cohesion: strengthening trust in commanders and unity of the unit. After combat (rehabilitation): decompression: the primary form of rehabilitation immediately after leaving the combat zone; psychological rehabilitation: restoration of body functions, correction of PTSD and depressive states; social adaptation: assistance in returning to a peaceful life and family.

Forms of support: individual counseling: working with trauma, loss or personal crises; group activities: psychological debriefings to respond to negative emotions after combat; psychoeducation: informing military personnel about how war affects the psyche and how to recognize dangerous states. The emotional-volitional sphere of a serviceman is the "inner core" that determines his ability to maintain self-control, follow orders and act effectively in conditions of mortal danger.

In combat conditions, this area is subjected to the greatest load. Let's consider its key components:

- Emotional component (what the fighter feels).

Emotions in war perform a protective function, but can also disorganize behavior: combat stress and fear: A natural reaction to danger. Psychological support is aimed at ensuring that fear does not develop into panic, but becomes a mechanism of vigilance; emotional stability: the ability to maintain relative stability of mood, not to fall into

apathy or excessive aggression; “combat fervor” or courage: a state of high emotional elation that temporarily blocks feelings of fatigue and pain; emotional coarsening: a protective mechanism of the psyche (“psychological armor”), when a person becomes less sensitive to suffering (his own and others) in order to survive.

- Volitional component (ability to act)

Will is the conscious control of one's behavior to achieve a goal, despite obstacles: courage and self-control: the ability to suppress the instinct of self-preservation for the sake of completing a task or saving comrades; determination: the ability to quickly make responsible decisions in conditions with little amount of time and information; perseverance: the ability to perform monotonous or extremely difficult work for a long time (for example, holding positions under fire); discipline: internal readiness to subordinate one's desires to the commander's orders. Factors that destroy the emotional-volitional sphere: uncertainty: lack of information about the terms of rotation or the enemy's plans; lack of sleep and exhaustion: physiology directly affects the will; an exhausted person loses control over emotions; psychological trauma: the death of comrades, the appearance of serious injuries; long waiting: "Trench disease", when due to the lack of active actions, the will is "eroded" by boredom and anxiety.

Support and recovery methods: psychotechniques of self-regulation: breathing exercises (for example, "square breathing"), muscle relaxation, "grounding".; combat unity: faith in a comrade nearby is the strongest stimulus for the will; ritualization: Adherence to habitual actions (shaving, cleaning weapons, eating together) helps the brain feel in control of the situation.

The work of a clinical psychologist with military personnel differs from the work of a military psychologist (who is usually located in a unit) in that it focuses on the diagnosis and treatment of specific mental disorders and conditions that have arisen as a result of combat experience.

A clinical psychologist works mainly in hospitals, rehabilitation centers, or specialized clinics. Main areas of work: Pathopsychological diagnostics: differential diagnostics: differentiation of combat fatigue, reactive state, and clinical disorders (PTSD, depression, anxiety disorders); assessment of cognitive functions (memory, attention, thinking) after concussions and traumatic brain injuries (TBI); identification of suicidal risks and predisposition to addictive behavior (alcohol, drugs).

Combat trauma therapy: PTSD (Post-traumatic stress disorder): working with flashbacks, nightmares, and hyperarousal. "Survivor's guilt": working with severe ethical dilemmas and emotional pain due to the loss of comrades. Moral trauma: working with cases when the events of the war violated the deep moral beliefs of the soldier.

3. Working with physical injuries and amputations: psychological assistance in accepting a new body image; working with phantom pains (through mirror therapy or visualization). Motivation for the long-term process of prosthetics and physical rehabilitation.

4. Neuropsychological rehabilitation: restoring mental processes after acubarotraumas (concussions); helping with adaptation in organic brain lesions. Clinical protocols and methods (evidence-based medicine): Clinical psychologists most often use CBT (Cognitive Behavioral Therapy) to change destructive thoughts and behavioral patterns. EMDR (Experiential Learning Therapy): desensitization and processing of trauma using eye movements (one of the most effective methods for PTSD). Exposure therapy: gradual and safe "living" of traumatic memories to reduce their impact.

Therapy regimen: working with deep beliefs formed in extreme conditions.

Interaction with a psychiatrist

Unlike civilian counseling, a clinical psychologist often works in tandem with a psychiatrist when working with the military. The psychiatrist prescribes medication support (antidepressants, sleeping pills), and the clinical psychologist conducts in-depth psychotherapeutic work.

Features of psychological rehabilitation of military personnel

First and foremost, it should be emphasized that the socio-psychological rehabilitation of military personnel in Ukraine is guaranteed by the state and provided free of charge, so anyone can seek help. There are various ways to do this today. For example, obtaining a referral from a family physician or attending a psychotherapist independently. There is also the option to go to a specialized rehabilitation center or, if a member of the military has a physical injury and is in a hospital, to get help there. Psychological rehabilitation must be carried out according to an individual plan developed on the basis of a confidential conversation with the military personnel and their complaints. Such a personalized approach allows you to achieve positive changes in the shortest possible time. Rehabilitation itself includes both the use of medications and individual or group work with a psychotherapist. The most popular methods used by specialists include: cognitive training; vestibular training; neurofeedback therapy; individual and group psychotherapy; meditation and trance techniques; resource psychotherapy; projective techniques; and methods of self-identification and self-actualization.

Considerable attention should also be paid to physical therapy, art therapy, hypnotherapy, and other methods that enhance the effect of the primary treatment. An important factor is the support of relatives and friends, which helps military personnel recover faster. Currently, there are many aspects of the work of clinical psychologists

in the area of psychological support for military personnel, and responsibility for further professional rehabilitation and psychological support is assigned. This issue of the specified topic continues to be studied further.

CONCLUSIONS

The results of the conducted analysis of the multimodal nature of emotional experiences allow for the formulation of a coherent theoretical concept for the restoration and preservation of mental health. The leading provisions of this work are based on an understanding of emotion not as a static state, but as a dynamic system that unites the cognitive, affective, somatic, and temporal dimensions of human experience.

1.Neurobiological substrate and plasticity of somatic processes. A fundamental conclusion of the section is the rationale that neuroplasticity is not limited predominantly to cognitive memory structures. It directly encompasses somatic processes through the dynamic updating of the brain's interoceptive maps. We assert that the somatic dimension of emotion is a flexible object of transformation. The nervous system's capacity for structural restructuring of synaptic connections in response to new experience allows bodily patterns to be viewed not as immutable "imprints" of the past, but as plastic representations subject to neurobiological reconstruction.

2.Multimodal disorganization and the mechanism of the incomplete emotional wave. It is theoretically substantiated that a key factor in the destabilization of mental health is the disintegration of multimodal integration. One manifestation of such disorganization is the mechanism of the incomplete emotional wave (IEW). Psychosomatic fixation within the IEW framework is interpreted as a form of energetic and temporal inertia, in which the emotional cycle is interrupted at the stage of peak arousal. This causes the formation of rigid biological threat predictions, leading to chronic allostatic load and subsequent somatization at the bifurcation points of the individual's biological cycle.

3.Polymodal integration and the identification of prediction error. The transition from fixation to the neuroplastic reconstruction of experience requires the application of a polymodal approach that ensures synchronous work with all components of the experience. It is the emergence of a critical prediction error between expected danger and real physical calm (ventral vagal safety) that opens the neurobiological window of memory reconsolidation. This discrepancy between the internal threat model and

current interoceptive safety signals initiates the modification of predictive models of affective response, allowing the system to integrate previously blocked experience.

4.Chronodynamic perspective and mathematical modeling. The hypothesis regarding the temporal periodicity of emotional processes is of significant importance for modern psychology. Viewing the IEW as a temporal anomaly suggests that relapses of maladaptive states correlate with objective biological rhythms and the individual's intrinsic time constant. This creates a foundation for developing mathematical models to forecast periods of maximum therapeutic plasticity, transforming psychological assistance into a strategic unblocking of the subjective temporal continuum.

5.Methodological foundations of polymodal intervention and process-based change management. The algorithmic basis of polymodal intervention, grounded in the principles of process-based management of an individual's neuroplasticity, has been theoretically substantiated. Unlike classical diagnostic models, the focus of intervention within our approach is not an isolated symptom but a set of universal processes of change encompassing the cognitive, affective, and somatic modalities of the individual's experience. The central mechanism of such transformation is the creation of a managed mismatch between the cognitive threat prediction and the current state of somatic safety in the form of ventral vagal regulation. The identification of this prediction error initiates molecular cascades of memory reconsolidation, allowing the incomplete emotional wave to transition into a labile state and ensuring its ecological integration into the structure of a coherent narrative self. Such an approach enables the system's transition from rigid patterns of psychosomatic fixation to adaptive self-regulation and psychological flexibility, which are determining factors in the restoration and preservation of mental health under conditions of prolonged stress.

In summary, it can be asserted that the multimodal approach acts as a fundamental methodological basis for building modern strategies for the preservation and restoration of mental health, as it is grounded in the profound ontological unity of consciousness, body, and time. Within this paradigm, the transformation of an incomplete emotional wave into an integrated autobiographical experience is viewed as one of the leading aspects of realizing the individual's neuroplastic potential,

determining their transition from maladaptive survival strategies to the formation of a resilient and coherent self-concept. Restoring the natural chronometry of the affective process through polymodal integration allows for rewriting the emotional finale of past events and structurally updating the emotional memory trace within the reconsolidation window, transforming the implicit memory of traumatic fixation into a conscious resource of resilience. Thus, the multimodal nature of emotional experiences emerges not only as a theoretical construct but also as a practical tool for accessing the mechanisms of experience reconsolidation, ensuring the individual's resilience to the psychosomatic challenges of the modern era.

As a result of the theoretical study of the problem of anxiety disorders in children and adolescents with autism spectrum disorders, the set goal was achieved, and certain scientific tasks were solved, which allowed us to formulate the following generalized conclusions:

6. A systematic analysis of scientific approaches to the definition of the concepts of "anxiety" and "anxiety disorders" was carried out. It was established that these phenomena have a complex multi-level structure and are considered within the framework of leading theoretical paradigms as integrative mental formations. The generalization of approaches allowed us to clarify their content in the context of childhood and adolescence.

7. Theoretical provisions regarding the psychological and neuropsychological features of the development of children and adolescents with autism spectrum disorders were generalized. It was established that the specificity of social and communicative disorders, sensory processing, and cognitive regulation acts as a system-forming factor in the formation of an increased level of anxiety.

8. Based on the analysis of modern scientific sources, it was determined that anxiety disorders are typical comorbid conditions in ASD and are characterized by high prevalence and variability of manifestations. It was clarified that their clinical and psychological structure includes generalized anxiety, social anxiety, specific phobias, and obsessive-compulsive symptoms with atypical phenomenology.

9. The qualitative specificity of anxiety manifestations in children and adolescents with ASD was revealed, which consists of their external similarity to autistic behavioral patterns. This complicates the process of differential diagnosis and requires clarification of the criteria for distinguishing anxiety disorders from the basic symptoms of autism.

10. It is substantiated that existing approaches to the diagnosis of anxiety disorders do not fully take into account the characteristics of individuals with ASD. The need to develop specialized psychodiagnostic tools adapted to the cognitive and communicative characteristics of this category has been proven.

11. The insufficient level of theoretical development of the problem of anxiety disorders in children and adolescents with ASD in domestic science has been established, which is manifested in the absence of holistic conceptual models and systematic approaches to its study.

12. The feasibility of using an integrative approach, which involves the analysis of the interaction of biological, psychological, and social factors in the formation of anxiety, has been theoretically substantiated. It has been determined that such an approach provides a more complete understanding of the mechanisms of the emergence and course of anxiety disorders in ASD.

13. Promising directions for further scientific research have been identified, including: the development of theoretical models of anxiety in ASD; empirical verification of the mechanisms of its formation; the creation of valid diagnostic methods; and the development and implementation of effective programs of psychocorrection and psychological support.

14. It is proven that the results of the study have theoretical significance for the development of personality psychology, age, and special psychology, as well as practical significance for improving the system of psychological assistance to children and adolescents with autism spectrum disorders.

Thus, the conducted study expands theoretical ideas about the nature of anxiety disorders in children and adolescents with ASD and creates a basis for further scientific and applied developments in this direction.

REFERENCES

References to section 1

1. Bachem, R., Casey, P. (2018). Adjustment disorder: A diagnosis whose time has come. *Journal of Affective Disorders*, 227, 243–253. [in English].

2. Zelviene, P., Kazlauskas, E. (2018). Adjustment disorder: current perspectives. *Neuropsychiatric Disease and Treatment*, 14, 375–381. [in English].

3. Baumeister, H., Kufner, K. (2009). It is time to adjust the adjustment disorder category. *Current Opinion in Psychiatry*, 22, 4, 409–412. [in English].

4. Lazarus, R. S., Folkman, S. (1984). Stress, Appraisal, and Coping. *New York: Springer*. [in English].

5. Maercker, A., Einsle, F., Köllner, V. (2007). Adjustment disorders as stress response syndromes: *A new diagnostic concept and its exploration in a medical sample. Psychopathology*, 40, 135–146. [in English].

6. Glaesmer, H., Romppel, M., Brähler, E., Hinz, A., Maercker, A. (2015). Adjustment disorder as proposed for ICD-11: *Dimensionality and symptom differentiation. Psychiatry Research*, 229, 3, 940–947. [in English].

7. Hobfoll, S. E., Watson, P., Bell, C. C., Bryant, R. A., Brymer, M. J., Friedman, M. J., Friedman, M., Gersons, B. P. R., de Jong, J. T. V. M., Layne, C. M., Maguen, S., Neria, Y., Norwood, A. E., Pynoos, R. S., Reissman, D., Ruzek, J. I., Shalev, A. Y., Solomon, Z., Steinberg, A. M., Ursano, R. J. (2007). Five essential elements of immediate and mid-term mass trauma intervention: Empirical evidence. *Psychiatry*, 70, 4, 283–315. [in English].

8. World Health Organization. (2019). International Classification of Diseases 11th Revision (ICD-11). *Geneva: World Health Organization*. [in English].

9. Appart, A., Lange, A. K., Sievert, I., Bihain, F., Tordeurs, D. (2017). Adjustment disorder and DSM-5: *A review. L'Encéphale,* 43, 1, 41–46. [in English].

10. Spitzer, R. L., Kroenke, K., Williams, J. B. W., Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder. *Archives of Internal Medicine,* 166, 10, 1092–1097. [in English].

11. Kroenke, K., Spitzer, R. L., Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine,* 16, 9, 606–613. [in English].

12. Bovin, M. J., Marx, B. P., Weathers, F. W., Gallagher, M. W., Rodriguez, P., Schnurr, P. P., Keane, T. M. (2016). Psychometric properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (PCL-5) in veterans. *Psychological Assessment,* 28, 11, 1379–1391. [in English].

13. Arnsten, A. F. T. (2009). Stress signalling pathways that impair prefrontal cortex structure and function. *Nature Reviews Neuroscience,* 10, 410–422. [in English].

14. Hoge, C. W., McGurk, D., Thomas, J. L., Cox, A. L., Engel, C. C., Castro, C. A. (2008). Mild traumatic brain injury in U.S. soldiers returning from Iraq. *New England Journal of Medicine,* 358, 5, 453–463. [in English].

15. Nasreddine, Z. S., Phillips, N. A., Bédirian, V., Charbonneau, S., Whitehead, V., Collin, I., Cummings, J. L., Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: A brief screening tool for mild cognitive impairment. *Journal of the American Geriatrics Society*, 53, 4, 695–699. [in English].

16. Diamond, A. (2013). Executive functions. *Annual Review of Psychology,* 64, 135–168. [in English].

17. Golden, C. J., Freshwater, S. M. (2002). Stroop Color and Word Test: A Manual for Clinical and Experimental Uses. *Wood Dale: Stoelting.* [in English].

18. Gualtieri, C. T., Johnson, L. G. (2006). Reliability and validity of a computerized neurocognitive test battery, CNS Vital Signs. *Archives of Clinical Neuropsychology*, 21, 7, 623–643. [in English].

19. Goldberg, E. (2009). The New Executive Brain: Frontal Lobes in a Complex World. New York: *Oxford University Press.* [in English].

20. Benedict, R. H. B., Schretlen, D., Groninger, L., Brandt, J. (1998). Hopkins Verbal Learning Test–Revised: Normative data and analysis of inter-form and test-retest reliability. *The Clinical Neuropsychologist*, 12, 1, 43–55. [in English].

21. Benedict, R. H. B., Schretlen, D., Groninger, L., Dobraski, M., Shpritz, B. (1996). Revision of the Brief Visuospatial Memory Test: Studies of normal performance, reliability, and validity. *Psychological Assessment*, 8, 2, 145–153. [in English].

22. Meyers, J. E., Meyers, K. R. (1995). Rey Complex Figure Test and Recognition Trial: Professional Manual. Odessa: *Psychological Assessment Resources*. [in English].

23. Raven, J., Raven, J. C., Court, J. H. (2000). Manual for Raven's Progressive Matrices and Vocabulary Scales. Section 3: *The Standard Progressive Matrices.* Oxford: Oxford Psychologists Press. [in English].

24. Dubois, B., Slachevsky, A., Litvan, I., Pillon, B. (2000). The FAB: A Frontal Assessment Battery at bedside. *Neurology*, 55, 11, 1621–1626. [in English].

25. Delis, D. C., Kaplan, E., Kramer, J. H. (2001). Delis–Kaplan Executive Function System: Examiner's Manual. San Antonio: *The Psychological Corporation.* [in English].

26. Heaton, R. K., Chelune, G. J., Talley, J. L., Kay, G. G., Curtiss, G. (1993). Wisconsin Card Sorting Test Manual: Revised and Expanded. *Lutz: Psychological Assessment Resources.* [in English].

27. American Psychiatric Association. (2022). Diagnostic and Statistical Manual of Mental Disorders. 5th ed., text rev. *Washington: American Psychiatric Association.* [in English].

28. Koob, G. F., Volkow, N. D. (2016). Neurobiology of addiction: A neurocircuitry analysis. *The Lancet Psychiatry*, 3, 8, 760–773. [in English].

29. Weber, A. N., Michail, M., Thompson, A., Fiedorowicz, J. G. (2017). Psychiatric emergencies: Assessing and managing suicidal ideation. *The Medical Clinics of North America,* 101, 3, 553–571. [in English].

30. Lorenz, L., Bachem, R. C., Maercker, A. (2016). The Adjustment Disorder–New Module 20 as a screening instrument: Cluster analysis and cut-off values. *The International Journal of Occupational and Environmental Medicine,* 7, 4, 215–220. [in English].

31. Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine*, 4, 1, 92–100. [in English].

32. Mundt, J. C., Marks, I. M., Shear, M. K., Greist, J. H. (2002). The Work and Social Adjustment Scale: A simple measure of impairment in functioning. *The British Journal of Psychiatry,* 180, 461–464. [in English].

33. Rogers, C. R. (1957). The necessary and sufficient conditions of therapeutic personality change. *Journal of Consulting Psychology,* 21, 2, 95–103. [in English].

34. Rokeach, M. (1973). The Nature of Human Values. *New York: Free Press.* [in English].

35. Berne, E. (1961). Transactional Analysis in Psychotherapy. *New York: Grove Press.* [in English].

36. Jung, C. G. (1968). The Archetypes and the Collective Unconscious. 2nd ed. *Princeton: Princeton University Press.* [in English].

37. Perls, F., Hefferline, R., Goodman, P. (1951). Gestalt Therapy: Excitement and Growth in the Human Personality. *New York: Julian Press.* [in English].

38. Cheng, C. (2001). Assessing coping flexibility in real-life and laboratory settings: *A multidimensional approach. Journal of Personality and Social Psychology,* 80, 5, 814–833. [in English].

39. Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology,* 3, 1–27. [in English].

40. Hayes, A. M., Laurenceau, J. P., Feldman, G., Strauss, J. L., Cardaciotto, L. (2007). Change is not always linear: The study of nonlinear and discontinuous patterns of change in psychotherapy. *Clinical Psychology Review*, 27, 6, 715–723. [in English].

References to section 2

41. Appleton, A. A., & Kubzansky, L. D. (2014). Emotion regulation and cardiovascular disease risk. *In J. J. Gross (Ed.), Handbook of emotion regulation*. 2nd ed. PP. 596–612. Guilford Press.

42. Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.). *The psychology of learning and motivation.* Vol. 2, PP. 89–195. Academic Press. https://doi.org/10.1016/S0079-7421(08)60422-3.

43. Barrett, L. F. (2017). The theory of constructed emotion: An active inference account of interoception and categorization. *Social Cognitive and Affective Neuroscience,* 12(1), 1–23. https://doi.org/10.1093/scan/nsw154

44. Blinov, O. A. (2022). Psykholohiia stresu ta psykhotravmy: mekhanizmy neiroplastychnosti ta rekonstruktsii pamiati [Psychology of stress and psychotrauma: Mechanisms of neuroplasticity and memory reconstruction]. *Problemy suchasnoi psykholohii*, 55, 45–58. https://doi.org/10.32626/2227-6246.2022-55.45-58

45. Bobba-Alves, N., Juster, R. P., & Picard, M. (2022). The energetic cost of allostasis and allostatic load. *Psychoneuroendocrinology,* 146, Article 105951. https://doi.org/10.1016/j.psyneuen.2022.105951

46. Boudrias, S. (2021). Neuroscience and somatic art therapy. *In Art therapy in the early years. Routledge.* https:// doi.org/10.4324/9781003023746-8.

47. Chebykin, O. Ya. (2021). Rehuliatsiia emotsiinykh staniv: systemno-diialnisnyi ta polimodalnyi pidkhody [Regulation of emotional states: System-activity and polymodal approaches]. *Nauka i osvita*, 29(3), 5–12.

48. Conway, M. A., & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review,* 107(2), 261–288. https://doi.org/10.1037/0033-295X.107.2.261

49. Cozolino, L. (2017). The neuroscience of psychotherapy: Healing the social brain (3rd ed.). *W. W. Norton & Company.*

50. Craig, A. D. (2009). How do you feel now? The anterior insula and human awareness. *Nature Reviews Neuroscience*, 10(1), 59–70. https://doi.org/10.1038/nrn2555

51. Dich, N., Doan, S. N., Kivimäki, M., Kumari, M., & Rod, N. H. (2014). A non-linear association between self-reported negative emotional response to stress and subsequent allostatic load: Prospective results from the Whitehall II cohort study. *Psychoneuroendocrinology*, 49, 96–109.

https://doi.org/10.1016/j.psyneuen.2014.07.001

52. Doidge, N. (2007). The brain that changes itself: Stories of personal triumph from the frontiers of brain science. *Viking.*

53. Ecker, B., Ticic, R., & Hulley, L. (2012). Unlocking the emotional brain: Eliminating symptoms at their roots using memory reconsolidation. *Routledge.*

54. Ellis, E. M., Prather, A. A., Grenen, E. G., & Ferrer, R. A. (2019). Direct and indirect associations of cognitive reappraisal and suppression with disease biomarkers. *Psychology and Health*, 34(8), 1024–1042.

https://doi.org/10.1080/08870446.2018.1529313

55. Friston, K. (2010). The free-energy principle: A unified brain theory? *Nature Reviews Neuroscience,* 11(2), 127–138. https://doi.org/10.1038/nrn2787

56. Gorbunova, V. V., & Klymchuk, V. O. (2021). Posttravmatychne zrostannia: vid emotsiinoho reahuvannia do kohnityvnoi intehratsii dosvidu [Post-traumatic growth: From emotional response to cognitive integration of experience]. *Ukrainskyi psykholohichnyi zhurnal,* 15(1), 45–59.

57. Haeyen, S. (2024). A theoretical exploration of polyvagal theory in creative arts and psychomotor therapies for emotion regulation in stress and trauma. *Frontiers in Psychology*, *15*, Article 1382007. https://doi.org/10.3389/fpsyg.2024.1382007

58. Hoehne, S. (2024). Predicting the likelihood and amount of fading, fixed, flourishing, and flexible positive and negative affect of autobiographical memories. *Memory,* 32(1), 45–60. https://doi.org/10.1080/09658211.2023.2293456

59. Hofmann, S. G., & Hayes, S. C. (2019). The future of intervention science: Process-based therapy. *Clinical Psychological Science,* 7(1), 37–50. https://doi.org/10.1177/2167702618772296

60. Hofmann, S. G., & Hayes, S. C. (2024). A process-based approach to transtheoretical clinical research and training. *Clinical Psychology in Europe*, 6 (Special Issue), Article e11987. https://doi.org/10.32872/cpe.11987

61. Kahneman, D. (2011). Thinking, fast and slow. *Farrar, Straus and Giroux.*

62. Kokun, O. M. (2020). Psykhofiziolohichni ta neirobiolohichni markery psykhosomatychnykh porushen v umovakh tryvaloho stresu [Psychophysiological and neurobiological markers of psychosomatic disorders under prolonged stress]. *Visnyk*

Natsionalnoi akademii pedahohichnykh nauk Ukrainy, 2(1), 1–9. https://doi.org/10.32405/2663-5739-2020-2-1-1-9

63. Lane, R. D. (Ed.). (2020). Neuroscience of enduring change. *Oxford University* Press. https://doi.org/10.1093/oso/9780190881511.001.0001

64. Lane, R. D., Ryan, L., Nadel, L., & Greenberg, L. (2015). Memory reconsolidation, emotional arousal, and the process of change in psychotherapy: New insights from brain science. *Behavioral and Brain Sciences,* 38, Article e1. https://doi.org/10.1017/S0140525X1400004X

65. Lazzarelli, A., Scafuto, F., Crescentini, C., Matiz, A., Orrù, G., Ciacchini, R., Alfì, G., Gemignani, A., & Conversano, C. (2024). Interoceptive ability and emotion regulation in mind–body interventions: *An integrative review. Behavioral Sciences*, 14(11), Article 1107. https://doi.org/10.3390/bs14111107

66. Linson, A., & Friston, K. (2024). Active inference and the emotional brain: A process theory of affective consciousness. *Neuroscience & Biobehavioral Reviews*, 156, Article 105497. https://doi.org/10.1016/j.neubiorev.2023.105497

67. Loftus, E. F. (2005). Planting misinformation in the human mind: A 30-year investigation of the malleability of memory. *Learning & Memory,* 12(4), 361–366. https://doi.org/10.1101/lm.94705

68. Malyhina, V., & Savenkova, I. I. (2026, February 20). The emotional wave as a dynamic mechanism of experience reconstruction: An integrative model of affect and neuroplasticity [Preprint]. *SSRN*. http://dx.doi.org/10.2139/ssrn.6276978

69. Maksymenko, S. D., & Kuzminskyi, V. A. (2022). Neiropsykholohichni mekhanizmy emotsiinoi rehuliatsii ta strukturno-dynamichna orhanizatsiia dosvidu [Neuropsychological mechanisms of emotional regulation and the structural-dynamic organization of experience]. *Psykholohichnyi zhurnal*, 8(2), 14–25.

70. McEwen, B. S., & Gianaros, P. J. (2010). Central role of the brain in stress and adaptation: Links to socioeconomic status, health, and disease. *Annals of the New York Academy of Sciences*, 1186(1), 190–222. https://doi.org/10.1111/j.1749-6632.2009.05331.x

71. Menon, V. (2011). Large-scale brain networks and psychopathology: Unifying triple network model. *Trends in Cognitive Sciences*, 15(10), 483–506. https://doi.org/10.1016/j.tics.2011.08.003

72. Moskow, D. M., Ong, C. W., Hayes, S. C., & Hofmann, S. G. (2023). Process-based therapy: A personalized approach to treatment. *Journal of Experimental Psychopathology*, 14(1), Article 20438087231152848.

https://doi.org/10.1177/20438087231152848

73. Mushkevych, M. I. (2021). Intehratyvnyi pidkhid u psykhoterapii psykhosomatychnykh zakhvoriuvan: teoretyko-metodolohichnyi analiz [An integrative approach in the psychotherapy of psychosomatic diseases: A theoretical and methodological analysis]. *Psykholohichni perspektyvy*, 38, 112–124.

74. Nader, K., & Hardt, O. (2009). A single standard for memory: The case for reconsolidation. *Nature Reviews Neuroscience*, 10(3), 224–234. https://doi.org/10.1038/nrn2590

75. Osadcha, O. V. (2022). Tilesno-oriientovani ta kohnityvni aspekty u strukturi psykhosomatychnoho symptomu [Body-oriented and cognitive aspects in the structure of the psychosomatic symptom]. *Psykholohiia ta sotsialna robota*, 26(1), 77–88.

76. Piñeyro, M., Ferrer Monti, R. I., Díaz, H., Bueno, A. M., Bustos, S. G., & Molina, V. A. (2018). Positive emotional induction interferes with the reconsolidation of negative autobiographical memories, in women only. *Neurobiology of Learning and Memory*, 155, 508–518. https://doi.org/10.1016/j.nlm.2018.08.003

77. Porges, S. W. (2011). The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation. W. W. Norton & Company.

78. Price, C., & Hooven, C. (2018). Interoceptive awareness skills for emotion regulation: Theory and approach of mindful awareness in body-oriented therapy (MABT). *Frontiers in Psychology*, 9, Article 798.

https://doi.org/10.3389/fpsyg.2018.00798

79. Savenkova, I. I. (2014). Khronopsykholohichne prohnozuvannia perebihu zakhvoriuvan u psykhosomatychnykh khvorykh [Chronopsychological forecasting of the course of diseases in psychosomatic patients] [*Monograph*]. Borys Grinchenko Kyiv University.

80. Savenkova, I. I. (2018). Psychology of time and individual psychological development [*Monograph*]. Astroprint.

81. Savenkova, I. I. (2020). Bifurcation points in the individual biological cycle of humans: A chronopsychological aspect. *Journal of Psychological Research*, 4(2), 115–123.

82. Savenkova, I., Didukh, M., Khazratova, N., & Snyadanko, I. (2019). Psychosomatic unity of human from the position of chronopsychology on the example of ischemic disorders and heart diseases. *Electronic Journal of General Medicine*, 16(6), Article em157. https://doi.org/10.29333/ejgm/114263

83. Savenkova, I., Didukh, M., Khazratova, N., & Voitsekhovska, O. (2020). *Chronopsychological forecast of nephrourological diseases*. EurAsian Journal of BioSciences, 14(1), 2411–2415.

84. Schacter, D. L., & Addis, D. R. (2007). The cognitive neuroscience of constructive memory: Remembering the past and imagining the future. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 362(1481), 773–786. https://doi.org/10.1098/rstb.2007.2087

85. Seth, A. K., & Friston, K. J. (2016). Active interoceptive inference and the emotional brain. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 371(1708), Article 20160007. https://doi.org/10.1098/rstb.2016.0007

86. Smulson, M. L. (2020). Kohnityvna psykholohiia i protsesy rekonstruktsii dosvidu: suchasni vymiry ta perspektyvy [Cognitive psychology and the processes of experience reconstruction: Modern dimensions and perspectives]. *Aktualni problemy psykholohii*, 8(11), 15–28.

87. Stein, M., Rohde, K. B., & Henke, K. (2015). Focus on emotion as a catalyst of memory updating during reconsolidation. *Behavioral and Brain Sciences*, 38, Article e1. https://doi.org/10.1017/S0140525X14000314

88. Tabibnia, G., & Radecki, D. (2018). Resilience training that can change the brain. *Consulting Psychology Journal*, 70(1), 59–88.

https://doi.org/10.1037/cpb0000110

89. Tytarenko, T. M. (2023). Zhyttiestiikist osobystosti v umovakh prolonhovanoi travmatyzatsii: psykholohichni mekhanizmy vidnovlennia [Personality resilience under conditions of prolonged traumatization: Psychological mechanisms of recovery]. *Naukovi studii iz sotsialnoi ta politychnoi psykholohii*, 51, 34–46.

90. Tsukanov, B. Y. (2000). Vremya v psikhike cheloveka [Time in the human psyche] [*Monograph*]. Astroprint.

91. Van der Kolk, B. A. (2014). The body keeps the score: Brain, mind, and body in the healing of trauma. *Viking*.

92. Wayda-Zalewska, M., Pluta, A., Wolak, T., Wojtczak, M., Wojciechowski, J., & Kucharska, K. (2025). Interaction between emotion lability, emotion regulation and structural brain abnormalities in patients with anorexia nervosa and borderline personality disorder. *Frontiers in Neuroscience*, 19.

https://doi.org/10.3389/fnins.2025.1545599

93. Zavhorodnia, O. V. (2023). Multymodalni ta intehratyvni pidkhody do korektsii emotsiinykh staniv osobystosti v umovakh nevypravdanosti [Multimodal and integrative approaches to the correction of individual emotional states under conditions of uncertainty]. *Teoriia i praktyka suchasnoi psykholohii*, 6(1), 88–94.

References to section 3

94. Ахмедов Т. І. Психологічні проблеми тривожності. Харків: Харківська медична академія післядипломної освіти, 2005. 8 с.

95. Базима Н. В. Формування мовленнєвої активності у дітей з аутистичними порушеннями старшого дошкільного віку : автореф. дис. канд. пед. наук: 13.00.03. Київ, 2014. 20 с.

96.Бистрова Ю. О. Психолого-педагогічне забезпечення професійного самовизначення розумово відсталих підлітків. Освіта на Луганщині. 2010. № 2 (33). С. 149–155.

97. Бодальов В. О. Психологія криз: визначення, класифікація та механізми подолання. Київ : Либідь, 2018.

98. Бочелюк В. Й., Ковтун Р. А. Психологія прояву комунікативних здібностей дітей з особливими потребами. Запоріжжя: Класич. приват. ун-т, 2012. 223 с.

99. Борисенко О. М. Проблеми дитячого аутизму та психолого-педагогічні шляхи їх вирішення. *Науковий вісник Львівського державного університету внутрішніх справ.* 2015. Вип. 1. С. 3–12.

URL: http://journals.lvduvs.lviv.ua/index.php/psychology/article/view/228/224

100. Борзунова О. Онтогенетичний аналіз кризи та стресу: психологія підлітковості. Чернігів: Бук-трест, 2015. 227 с.

101. Варій М. Й. Загальна психологія: *навчальний посібник*. Львів : Край, 2005.

102. Вікова та педагогічна психологія: *навчальний посібник.* / О. В. Скрипченко, Л. В. Долинська, З. В. Огороднійчук та ін. Київ : Просвіта, 2001. 416 с.

103. Гончарук Л. О. Дитячі кризи та їх вплив на соціалізацію: сучасні підходи. Київ: Либідь, 2020. 240 с.

104. Гречко Л. М. Психологічний супровід дітей молодшого шкільного віку з вадами психофізичного розвитку в умовах інтегрованого навчання: автореф. дис. канд. психол. наук: 19.00.08. Київ, 2008. 20 с.

105. Діагностика та лікування тривожних розладів у дітей і підлітків. *НейроNEWS.* 2020. № 9 (120). С. 48–54.

106. Зливков В. Л., Лукомська С. О., Федан О. В. Психодіагностика особистості у кризових життєвих ситуаціях: *навчальний посібник*. Київ: Педагогічна думка, 2016. 219 с.

107. Іванова Т. Тривога як психологічний феномен. *Науковий вісник Львівського університету.* 2020. Вип. 6. С. 72–78.

108. К'єркегор С. Поняття страху. Київ : Академічний проєкт, 2020. 217 с.

109. Кирилова Л. Г., Ткачук Л. І. та ін. Діагностика когнітивної епілептиформної дезінтеграції з розладами аутистичного спектра у дітей раннього віку. *Perinatologiya i Pediatriya*. 2016. № 2 (66). С. 106–111.

110. Кларк Д., Бек А. Т. Тривога і занепокоєння: когнітивно-поведінковий підхід. Пер. з англ. Київ: Діалектика, 2020. 448 с.

111. Класифікатор хвороб та споріднених проблем охорони здоров'я НК 025:2021. Київ: Міністерство охорони здоров'я України, 2021. 1670 с.

112. Кокун О. М., Агаєв Н. А., Пішко І. О., Лозінська Н. С. Основи психологічних знань про психічні розлади для військового психолога: *метод. посібник*. Київ : НДЦ ГП ЗСУ, 2018. 310 с.

113. Кульчицька Л. Феноменологія акцентуацій у підлітковому віці. Київ : Вид-во НПУ ім. М. П. Драгоманова, 2013. 220 с.

114. Левковська Л. Психологічні чинники виникнення тривожності у осіб юнацького віку. *Молодий вчений.* 2022. № 1 (101).

URL: https://molodyivchenyi.ua/index.php/journal/article/view/3123/3092

115. Марценковський І. А., Бікшаєва Я. Б., Дружинська О. В. Базові принципи надання медичної допомоги дітям з розладами загального розвитку – розладами зі спектра аутизму. *НейроNews: психоневрологія і нейропсихіатрія.* 2007. Вип. 2. С.22-32.

116. Марценковський І. А., Марценковська І. І. Розлади аутистичного спектра: чинники ризику, особливості діагностики та терапії. *НейроNEWS: психоневрологія та нейропсихіатрія.* 2019. № 1 (102). С. 24–30.

117. Максименко С. Д., Зайчук В. О. та ін. Загальна психологія : *підручник.* Київ: Форум, 2000. 543 с.

118. Мельниченко В. Причини агресивної поведінки підлітків з розумовою відсталістю: *структурний аналіз.* Київ : Принт, 2015. 117 с.

119. Міжнародна класифікація хвороб. МКХ-10.

120. Михайлов Б. В., Сердюк О. І., Чугунов В. В. та ін. Експериментально-психологічне дослідження в загальній практиці – сімейній медицині: *навч. посібник.* / За ред. Б. В. Михайлова. 5-е вид., перероб. та доп. Харків : ХМАПО, 2014. 328 с.

121. Нерубаська А. О. Особливості розвитку дітей із розладом аутистичного спектру. *Габітус.* 2022. Вип. 44. С. 94–98.

DOI: https://doi.org/10.32782/2663-5208.2022.44.16

122. Ольховецький С. Феноменологія тривоги та страху. Проблеми сучасної психології. 2019. № 9. С. 174–193.

123. Онопрієнко О. Сім'я як чинник виникнення психоемоційних порушень підлітків. *Науковий часопис НПУ імені М. П. Драгоманова*. 2012. № 37 (61). С. 171–174.

124. Ондрієнко О. Психоневрологія підліткового віку. Черкаси : Криниця Ко, 2016. 283 с.

125. Островська К. О. Аутизм: проблеми психологічної допомоги: *навчальний посібник.* Львів : Видавничий центр ЛНУ імені Івана Франка, 2006. 110 с.

126. Островська К. О. Засади комплексної психолого-педагогічної допомоги дітям з аутизмом: [*Монографія*]. Львів : Тріада плюс, 2012. 520 с.

127. Островська К. О., Качмарик Х. В., Дробіт Л. Р. Основи діагностики дітей із розладами аутистичного спектра: *навч. посібник.* Львів: ЛНУ імені Івана Франка, 2017. 123 с.

128. Островська К. О., Рибак Ю. В., Мельник У. Р. та ін. Соціальний супровід дітей з аутизмом під час навчання. Львів : Тріада плюс, 2009. 188 с.

129. Пагава Д. Емоції та почуття підліткового віку за умов психофізіологічних порушень. Харків : Київські читання, 2017. 202 с.

130. Пасічняк Р. Ф. Особливості прояву толерантності до невизначеності батьків, які виховують дітей із розладом аутичного спектра. *Габітус.* 2025. Т. 2, № 69. С. 23–28. DOI: https://doi.org/10.32782/2663-5208.2025.69.2.4

131. Петренко О. В. Психологія молодіжних криз: проблеми самовизначення та соціалізації. Київ : Генеза, 2020. 220с.

132. Прокопчук Н. Особливості диференційної діагностики дітей з розладом аутистичного спектру. *Молодий вчений.* 2021. № 11. С. 82–96.

DOI: https://doi.org/10.32839/2304-5809/2021-11-99-3

133. Психологічний тлумачний словник найсучасніших термінів. Харків: Прапор, 2009. 672 с.

134. Романчук О. І. Когнітивно-поведінкова терапія тривожних розладів: модель розуміння, терапії та емпіричні докази ефективності. *НейроNews.* 2012. № 4 (39). С. 40–46. URL:https://i-cbt.org.ua/wp-content/uploads/2017/11/RomanchukAnxiety-disorders.pdf

135. Руденко Л. С. Підліткові кризи та їх вплив на соціальну адаптацію. Київ : Наукова думка, 2018.

136. Сафін О. Д., Гундерук Л. М. Регулятори агресивної поведінки особистості: *збірник наукових праць.* Хмельницький : Вид-во Академії ПВУ, 1996. № 2, ч. 3. С. 101–103.

137. Синьов В. М. Корекційна психопедагогіка. *Олігофренопедагогіка*: *підручник.* Ч.1: Загальні основи корекційної психопедагогіки (олігофренопедагогіки). Київ : Вид-во НПУ ім. М. П. Драгоманова, 2007. С.238-248.

138. Синьов В. М. Корекційна психопедагогіка. *Олігофренопедагогіка.* Ч. 2 : *Навчання і виховання дітей*: *підручник*. Київ : НПУ імені М. П. Драгоманова, 2009. С.186-197.

139. Синьов В. М., Коберник Г. М. Основи дефектології : *навч. посібник.* Київ, 2004. 126с.

140. Скрипник Т. В. Феноменологія аутизму: [*Монографія*]. Київ : Фенікс, 2010. 368 с.

141. Скрипник Т. В. Програма розвитку дітей із розладами аутистичного спектру «Розквіт»: *метод. рекомендації.* Київ: Інститут спеціальної педагогіки НАПН України, 2013. 80 с.

142. Стрілецька І. І. Тривожність як індивідуальна властивість особистості (теоретичний аспект). *Науковий часопис Національного педагогічного університету імені М. П. Драгоманова*. Серія 1 : Психологічні науки. 2015. Вип. 1 (46). С. 266–272.

143. Суховієнко Н. А., Бабич М. О., Гавриленко Т. Л. Діти із розладами аутистичного спектру в умовах воєнного стану: можливості психолого-педагогічної допомоги. *Габітус.* 2024. № 67. С. 284–288.

DOI: https://doi.org/10.32782/2663-5208.2024.67.47

144. Тарасун В. В. Етапи формування когнітивних стратегій поведінки у дітей з аутизмом (програмування, контролю, обробки інформації). *Дефектологія.* 2005. № 1. С. 25–30.

145. Тарасун В. В. Аутологія: [Монографія]. Київ: МП Леся, 2014. 580 с.

146. Тарасун В. В., Куценко Т. О., Скрипник Т. В. та ін. Комплексна програма розвитку дітей дошкільного віку з аутизмом «Розквіт». Київ, 2013. 234 с.

147. Тарасун В. В., Хворова Г. М. Концепція розвитку, навчання і соціалізації аутичних дітей: *навч. посібник.* / За наук. ред. В. Тарасун. Київ, 2004. 104 с.

148. Теоретичний аналіз феномену тривожності особистості у стресових ситуаціях. *Науковий блог Національного університету «Острозька академія».* 2025. № 1. С. 25–30. URL: https://naub.oa.edu.ua.

149. Томчук С. М., Томчук М. І. Психологія тривоги, страху та агресії особистості в освітньому процесі: [*Монографія*]. Вінниця : КВНЗ «ВАНО», 2018. 200 с.

150. Тривожні розлади: особливості перебігу, діагностування та лікування. *НейроNEWS.* 2019. № 10 (111). С. 37–40.

151. Туриніна О. Л. Вплив стилю сімейного виховання на особистісний розвиток підлітка. *The XVI International Scientific and Practical Conference «Integration of scientific solutions and methods into practice»,* April 24–25. Paris, 2023. С. 332–337.

152. Ушинський К. Д. Наука і мистецтво виховання. / Укл. С. Ф. Єгоров. Київ, 1994. 243с.

153. Хворова Г. М. Комплексна психолого-педагогічна технологія корекції розвитку активності дитини з аутизмом: автореф. дис. … канд. пед. наук : 13.00.03. Київ, 2010. 22 с.

154. Хворова Г. М. Особливості корекційно-розвивального навчання дітей з аутизмом. *Науковий часопис НПУ ім. М. П. Драгоманова.* Серія 19 : Корекційна педагогіка та психологія. 2004. № 1. С. 247–258.

155. Хворова Г. М. Особливості корекційно-розвивального навчання дітей з аутизмом. *Дефектологія.* Київ, 2005. № 2. С. 4–8.

156. Царькова О. В., Радченко С. В. Теоретичні аспекти прояву психологічного феномену тривожності. *Науковий вісник Мелітопольського державного педагогічного університету.* 2015. Вип. 38, ч. 7. С. 479–491.

157. Чабан О. С. Депресивні розлади у пацієнтів похилого віку: проблеми діагностики і терапії. *НейроNews.* 2014. № 2/1. С. 14–20.

158. Чепка О. Психолого-педагогічний супровід дітей з розладами аутичного спектра. *Збірник наукових праць Уманського державного педагогічного університету.* 2022. № 2. С. 209–220. DOI: https://doi.org/10.31499/2307-4906.2.2022.262966

159. Чистовська Ю. Ю., Харченко Т. Г., Жураківський І. О. Особливості виникнення і перебігу тривожних розладів та їх психотерапія. *Теорія і практика сучасної психології.* 2019. № 6, т. 1. С. 117–119. DOI: https://doi.org/10.32840/2663-6026.2019.6-1.24

160. Чуприков А. П., Хворова Г. М. Розлади спектра аутизму: медична та психолого-педагогічна допомога. Львів : Мс, 2012. 184 с.

161. Шаттенбург Л., Кульчинський Я. Групова терапія тривожних розладів у психосоматичній клініці. *Неврологія, Психіатрія, Психотерапія.* 2018. № 1 (44). С. 32–33.

162. Шеремет М. К. Розвиток мовленнєвої активності дітей з аутистичними порушеннями старшого дошкільного віку: *навч.-метод. посібник.* Київ, 2017. 192 с.

163. Шульженко Д. І. Основи психологічної корекції аутичних порушень у дітей. Київ, 2009. 386 с.

164. Шульженко Д. І. Аутизм – не вирок. Львів : Кальварія, 2010. 122 с.

165. Шульженко Д. І. Психологічні основи корекційного виховання дітей з аутистичними порушеннями : автореф. дис. … д-ра психол. наук : 19.00.08. Київ, 2010. URL: https://surl.li/ffbraq

166. Яремко Р., Гродська В., Дзюбак А., Ільків Х. Теоретичне дослідження проблеми тривожності особистості у психологічній літературі. *Молодий вчений.* 2022. № 5 (105). С. 83–86.

167. Ясточкіна І. А. Особистісна тривожність як соціально-психологічна проблема. *Науковий вісник Львівського університету*. 2020. Вип. 6. С. 165–170.

168. Ясточкіна І. А. Психологічні чинники виникнення та корекція особистісної тривожності у ранньому юнацькому віці: дис. … канд. психол. наук. Київ : Нац. пед. ун-т ім. М. П. Драгоманова, 2011. 20 с.

169. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. *5th ed. Arlington, VA : American Psychiatric Publishing,* 2013. P.120-139.

170. Antshel K. M., Russo N. Autism Spectrum Disorders and ADHD: Overlapping Phenomenology, Diagnostic Issues, and Treatment Considerations. *Current Psychiatry Reports*. 2019. Vol. 21, № 5. P. 34. DOI: https://doi.org/10.1007/s11920-019-1020-5

171. Baltas R. Psychological Development and Aging: Theoretical Approaches. *Cambridge University Press,* 2010. P.109-119.

172. Bejerot S., Eriksson J. M. Sexuality and Gender Role in Autism Spectrum Disorder: A Case Control Study. *PLoS One.* 2014. Vol. 9 (1).

DOI: /journal.pone.0087961

173. Boedhoe P. S. W., van Rooij D., Hoogman M. et al. Subcortical brain volume, regional cortical thickness and surface area variations across ADHD, ASD, and OCD. *Am J Psychiatry*. 2019. DOI: https://doi.org/10.1101/673012

174. Cervin M. Developmental signs of ADHD and autism: a prospective investigation in 3623 children. *European Child & Adolescent Psychiatry.* 2023. Vol. 32, № 10. P. 1969–1978. DOI: https://doi.org/10.1007/s00787-022-02024-4

175. Connolly S. D., Bernstein G. A. Practice parameter for the assessment and treatment of children and adolescents with anxiety disorders. *Journal of the American Academy of Child & Adolescent Psychiatry.* 2020. Vol. 59, № 10. P. 1102–1124.

176. Erikson E. H. The Life Cycle Completed. New York : W. W. Norton & Company, 1982. 220p.

177. Feldman Barrett L. Emotions Are Real. *American Psychologist.* 2012. P. 26–30.

178. Fisher R. S. et al. Operational classification of seizure types by the International League Against Epilepsy. Epilepsia. 2017. Vol. 51, № 4. P. 522–530.

179. Frazier T. W., Hardan A. Y. A meta-analysis of the corpus callosum in autism. *Biological Psychiatry.* 2009. Vol. 66, № 10. P. 935–941.

DOI: https://doi.org/10.1016/j.biopsych.2009.07.022

180. Freitag C. M., Luders E., Hulst H. E. et al. Total brain volume and corpus callosum size in medication-naïve adolescents and young adults with autism spectrum disorder. *Biological Psychiatry.* 2009. Vol. 66, № 4. P. 316–319. DOI: https://doi.org/10.1016/j.biopsych.2009.03.011.

181. Freud S. Inhibitions, Symptoms and Anxiety. London : Hogarth Press, 1926. 220p.

182. Freud S. New Introductory Lectures on Psycho-Analysis. New York : W. W. Norton & Company, 1933. 221p.

183. Goldstein K. Methodological approach to the study of schizophrenic thought disorder. *In: Language and Thought in Schizophrenia* / ed. J. S. Kasanin. New York : Norton, 1964. P. 17–39.

184. Gosch E. A., Flannery-Schroeder E., Mauro C. F., Compton S. N. Principles of cognitive-behavioral therapy for anxiety disorders in children. *Journal of Cognitive Psychotherapy.* 2006. Vol. 20, № 3. P. 247–262.

185. Haar S., Berman S., Behrmann M., Dinstein I. Anatomical Abnormalities in Autism? *Cerebral Cortex.* 2016. Vol. 26, № 4. P. 1440–1452.

DOI: https://doi.org/10.1093/cercor/bhu242

186. Havighurst R. J. Human Development and Education. New York : Longmans, Green, 1982. 120p.

187. Hawks Z. W., Marrus N., Glowinski A. L., Constantino J. N. Early Origins of Autism Comorbidity: Neuropsychiatric Traits Correlated in Childhood Are Independent in Infancy. *Journal of Abnormal Child Psychology*. 2019. Vol. 47, № 2. P. 369–379. DOI: https://doi.org/10.1007/s10802-018-0410-1

188. Hénault I. Asperger's Syndrome and Sexuality: *From Adolescence Through Adulthood. London* ; Philadelphia : Jessica Kingsley Publishers, 2006. 208 p.

189. Hilton C. L., Ratcliff K., Hong I. Predictors of Participation Difficulties in Autistic Children. *The American Journal of Occupational Therapy*. 2023. Vol. 77, № 2. P. 7702205010. DOI: https://doi.org/10.5014/ajot.2023.050068

190. Hollocks M. J., Wei Lerh J., Magiati I., Meiser-Stedman R., Brugha T. Anxiety and depression in adults with autism spectrum disorder: a systematic review and meta-analysis. *Psychological Medicine*. 2019. Vol. 49, № 4. P. 559–572.

191. Izard C. E. Human Emotions. New York : Springer Science & Business Media, 2013. 220p.

192. Jones R. M., Wheelwright S., Farrell K., Martin E. Brief report: female-to-male transsexual people and autistic traits. *Journal of Autism and Developmental Disorders*. 2012. Vol. 42, № 2. P. 301–306.

193. Jung C. G. Symbols of Transformation. *Collected Works of C. G. Jung*. Vol. 5. Princeton : Princeton University Press, 1967.

194. Kerns C. M., Newschaffer C., Berkowitz S. et al. Capturing the complexity of anxiety in youth with autism spectrum disorder. *Autism Research*. 2015. Vol. 8, № 1. P. 38–48.

195. Lachman M. E. The Handbook of Aging and the Individual. New York : Guilford Press, 2015. 120p.

196. Lundström S., Reichenberg A., Melke J. et al. Autism spectrum disorders and coexisting disorders in a nationwide Swedish twin study. *Journal of Child Psychology and Psychiatry*. 2015. Vol. 56, № 6. P. 702–710.

DOI: https://doi.org/10.1111/jcpp.12329

197. Mayo D., Corey S., Kelly L. H. et al. The role of trauma and stressful life events among individuals at clinical high risk for psychosis: a review. *Frontiers in Psychiatry*. 2017. Vol. 8. DOI: https://doi.org/10.3389/fpsyt.2017.00055

198. Mazurek M. O., Shattuck P. T., Wagner M., Cooper B. Prevalence and correlates of bullying involvement among adolescents with an autism spectrum disorder. *Archives of Pediatrics & Adolescent Medicine*. 2019. Vol. 173, № 11. P. 1093–1101.

199. Mohammadi M. R., Salmanian M., Akhondzadeh S. Autism spectrum disorders in Iran. *Iranian Journal of Child Neurology.* 2011. Vol. 5, № 4. P. 1–9.

200. Parenti I., Rabaneda L. G., Schoen H., Novarino G. Neurodevelopmental Disorders: From Genetics to Functional Pathways. *Trends in Neurosciences.* 2020. Vol. 43, № 8. P. 608–621. DOI: https://doi.org/10.1016/j.tins.2020.05.004

201. Pinto D., Delaby E. et al. Convergence of genes and cellular pathway dysregulated in autism spectrum disorder. *American Journal of Human Genetics.* 2014. Vol. 94, № 5. P. 677–694.

202. Reaven J., Blakeley-Smith A., Nichols S., Hepburn S. Facing Your Fears: Group Therapy for Managing Anxiety in Children with High-Functioning Autism Spectrum Disorders. Baltimore : *Paul H. Brookes Publishing,* 2011. 240 p.

203. Rodgers J., Glod M., Connolly B. et al. Development of the Anxiety Scale for Children with Autism Spectrum Disorder (ASC-ASD). *Autism Research.* 2016. Vol. 9, № 11. P. 1205–1215.

204. Schaaf R. C., Schoen S. A., Smith Roley S. et al. An intervention for sensory difficulties in children with autism: a randomized trial. *Journal of Autism and Developmental Disorders.* 2014. Vol. 44, № 7. P. 1493–1506.

205. Simpson K., Adams D., Malone S. et al. A Parent-Mediated Anxiety Intervention Specifically Tailored for Autistic Preschoolers: A Pilot Study. *The American Journal of Occupational Therapy.* 2023. Vol. 77, № 2. P. 7702185100. DOI: https://doi.org/10.5014/ajot.2023.050031

206. Siu M. T. Epigenetics of Autism Spectrum Disorder. *Advances in Experimental Medicine and Biology.* 2017. Vol. 978. P. 63–90.

207. Stickley A., Shirama A., Kitamura S. et al. Attention-deficit/hyperactivity disorder symptoms and sleep problems in preschool children: the role of autistic traits. *Sleep Medicine*. 2021. Vol. 83. P. 214–221.

DOI: https://doi.org/10.1016/j.sleep.2021.04.037

208. Stokes M., Newton N., Kaur A. Stalking, and Social and Romantic Functioning Among Adolescents and Adults with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*. 2007. Vol. 37, № 10. P. 1969–1986.

209. Van Steensel F. J. A., Bögels S. M., Dirksen C. Anxiety disorders in children and adolescents with autistic spectrum disorders: a meta-analysis. *Clinical Child and Family Psychology Review*. 2011. Vol. 14, № 3. P. 302–317.

210. Vasa R. A., Mazurek M. O., Kanne S. M. et al. Assessment and treatment of anxiety in youth with autism spectrum disorders. *Current Psychiatry Reports*. 2016. Vol. 18, № 7. P. 62.

211. Waye M. M. Y., Cheng H. Y. Genetics and epigenetics of autism: A review. *Psychiatry and Clinical Neurosciences*. 2018. Vol. 72, № 4. P. 228–244.

212. Wood J. J., Drahota A., Sze K. et al. Cognitive behavioral therapy for anxiety in children with autism spectrum disorders: a randomized, controlled trial. *Journal of Child Psychology and Psychiatry*. 2020. Vol. 61, № 2. P. 160–167.

213. Young S., Hollingdale J., Absoud M. et al. Guidance for identification and treatment of individuals with attention deficit/hyperactivity disorder and autism spectrum disorder based upon expert consensus. *BMC Medicine*. 2020. Vol. 18, № 1. P. 146. DOI: https://doi.org/10.1186/s12916-020-01585-y

References to section 4

214. Блінов, О. А. (2022). Психологія стресу та психотравми: механізми нейропластичності та реконструкції пам'яті. *Проблеми сучасної психології*, 55, С. 45–58. https://doi.org/10.32626/2227-6246.2022-55.45-58

215. Горбунова, В. В., & Климчук, В. О. (2021). Посттравматичне зростання: від емоційного реагування до когнітивної інтеграції досвіду. *Український психологічний журнал,* 15(1), С.45–59.

216. Завгородня, О. В. (2023). Мультимодальні та інтегративні підходи до корекції емоційних станів особистості в умовах невизначеності. *Теорія і практика сучасної психології*, 6(1), С.88–94.

217. Кокун, О. М. (2020). Психофізіологічні та нейробіологічні маркери психосоматичних порушень в умовах тривалого стресу. *Вісник Національної академії педагогічних наук України,* 2(1), 1–9.

https://doi.org/10.32405/2663-5739-2020-2-1-1-9

218. Максименко, С. Д., Кузьмінський, В. А. (2022). Нейропсихологічні механізми емоційної регуляції та структурно-динамічна організація досвіду. *Психологічний журнал*, 8(2), С. 14–25.

219. Мушкевич, М. І. (2021). Інтегративний підхід у психотерапії психосоматичних захворювань: теоретико-методологічний аналіз. *Психологічні перспективи,* 38, С.112–124.

220. Осадча, О. В. (2022). Тілесно-орієнтовані та когнітивні аспекти у структурі психосоматичного симптому. *Психологія та соціальна робота*, 26(1), С.77–88.

221. Савенкова, І. І. (2014). Хронопсихологічне прогнозування перебігу захворювань у психосоматичних хворих: [*Монографія*]. Київський університет імені Бориса Грінченка. 230с.

222. Смульсон, М. Л. (2020). Когнітивна психологія і процеси реконструкції досвіду: сучасні виміри та перспективи. *Актуальні проблеми психології*, 8(11), С.15–28.

223. Титаренко, Т. М. (2023). Життєстійкість особистості в умовах пролонгованої травматизації: психологічні механізми відновлення. *Наукові студії із соціальної та політичної психології,* 51, С.34–46.

224. Цуканов, Б. Й. (2000). Время в психике человека [*Монографія*]. Астропринт. 220с.

225. Чебикін, О. Я. (2021). Регуляція емоційних станів: системно-діяльнісний та полімодальний підходи. *Наука і освіта*, 29(3), С.5–12.

226. Appleton, A. A., & Kubzansky, L. D. (2014). Emotion regulation and cardiovascular disease risk. *In J. J. Gross (Ed.), Handbook of emotion regulation* (2nd ed., pp. 596–612). Guilford Press.

227. Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. *In K. W. Spence & J. T. Spence (Eds.), The psychology of learning and motivation* (Vol. 2, pp. 89–195). Academic Press. https://doi.org/10.1016/S0079-7421(08)60422-3

228. Barrett, L. F. (2017). The theory of constructed emotion: An active inference account of interoception and categorization. Social *Cognitive and Affective Neuroscience*, 12(1), 1–23. https://doi.org/10.1093/scan/nsw154

229. Bobba-Alves, N., Juster, R. P., & Picard, M. (2022). The energetic cost of allostasis and allostatic load. Psychoneuroendocrinology, 146, Article 105951. https://doi.org/10.1016/j.psyneuen.2022.105951

230. Boudrias, S. (2021). Neuroscience and somatic art therapy. *In Art therapy in the early years. Routledge.* https://doi.org/10.4324/9781003023746-8

231. Conway, M. A., & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review*, 107(2), 261–288. https://doi.org/10.1037/0033-295X.107.2.261

232. Cozolino, L. (2017). The neuroscience of psychotherapy: Healing the social brain (3rd ed.). *W. W. Norton & Company.*

233. Craig, A. D. (2009). How do you feel now? The anterior insula and human awareness. *Nature Reviews Neuroscience*, 10(1), 59–70. https://doi.org/10.1038/nrn2555

234. Dich, N., Doan, S. N., Kivimäki, M., Kumari, M., & Rod, N. H. (2014). A non-linear association between self-reported negative emotional response to stress and subsequent allostatic load: Prospective results from the Whitehall II cohort study. *Psychoneuroendocrinology*, 49, 96–109.

https://doi.org/10.1016/j.psyneuen.2014.07.001

235. Doidge, N. (2007). The brain that changes itself: Stories of personal triumph from the frontiers of brain science. *Viking*.

236. Ecker, B., Ticic, R., & Hulley, L. (2012). Unlocking the emotional brain: Eliminating symptoms at their roots using memory reconsolidation. *Routledge.*

237. Ellis, E. M., Prather, A. A., Grenen, E. G., & Ferrer, R. A. (2019). Direct and indirect associations of cognitive reappraisal and suppression with disease biomarkers. *Psychology and Health*, 34(8), 1024–1042.

https://doi.org/10.1080/08870446.2018.1529313

238. Friston, K. (2010). The free-energy principle: A unified brain theory? *Nature Reviews Neuroscience*, 11(2), 127–138. https://doi.org/10.1038/nrn2787

239. Giannoulis, M., et al. (2025). Interaction between emotion lability, emotion regulation and structural brain abnormalities. *Frontiers in Neuroscience*, 19. https://doi.org/10.3389/fnins.2025.1545599

240. Haeyen, S. (2024). A theoretical exploration of polyvagal theory in creative arts and psychomotor therapies for emotion regulation in stress and trauma. *Frontiers in Psychology*, 15, Article 1382007. https://doi.org/10.3389/fpsyg.2024.1382007

241. Hoehne, S. (2024). Predicting the likelihood and amount of fading, fixed, flourishing, and flexible positive and negative affect of autobiographical memories. *Memory*, 32(1), 45–60. https://doi.org/10.1080/09658211.2023.2293456

242. Hofmann, S. G., & Hayes, S. C. (2019). The future of intervention science: Process-based therapy. *Clinical Psychological Science*, 7(1), 37–50. https://doi.org/10.1177/2167702618772296

243. Hofmann, S. G., & Hayes, S. C. (2024). A process-based approach to transtheoretical clinical research and training. *Clinical Psychology in Europe*, 6 (Special Issue), Article e11987. https://doi.org/10.32872/cpe.11987

244. Kahneman, D. (2011). Thinking, fast and slow. *Farrar, Straus and Giroux*.

245. Lane, R. D. (Ed.). (2020). Neuroscience of enduring change. *Oxford University Press.* https://doi.org/10.1093/oso/9780190881511.001.0001

246. Lane, R. D., Ryan, L., Nadel, L., & Greenberg, L. (2015). Memory reconsolidation, emotional arousal, and the process of change in psychotherapy: New insights from brain science. *Behavioral and Brain Sciences,* 38, Article e1. https://doi.org/10.1017/S0140525X1400004X

247. Lazzarelli, A., et al. (2024). Interoceptive ability and emotion regulation in mind–body interventions: An integrative review. *Behavioral Sciences*, 14(11), Article 1107. https://doi.org/10.3390/bs14111107

248. Linson, A., & Friston, K. (2024). Active inference and the emotional brain: A process theory of affective consciousness. *Neuroscience & Biobehavioral Reviews*, 156, Article 105497. https://doi.org/10.1016/j.neubiorev.2023.105497

249. Loftus, E. F. (2005). Planting misinformation in the human mind: *A 30-year investigation of the malleability of memory. Learning & Memory*, 12(4), 361–366. https://doi.org/10.1101/lm.94705

250. Malyhina, V., & Savenkova, I. I. (2026, February 20). The emotional wave as a dynamic mechanism of experience reconstruction: An integrative model of affect and neuroplasticity [Preprint]. *SSRN*. http://dx.doi.org/10.2139/ssrn.6276978

251. McEwen, B. S., & Gianaros, P. J. (2010). Central role of the brain in stress and adaptation: Links to socioeconomic status, health, and disease. *Annals of the New York Academy of Sciences*, 1186(1), 190–222.

https://doi.org/10.1111/j.1749-6632.2009.05331.x

252. Menon, V. (2011). Large-scale brain networks and psychopathology: *Unifying triple network model. Trends in Cognitive Sciences*, 15(10), 483–506. https://doi.org/10.1016/j.tics.2011.08.003

253. Moskow, D. M., Ong, C. W., Hayes, S. C., & Hofmann, S. G. (2023). Process-based therapy: *A personalized approach to treatment. Journal of Experimental Psychopathology*, 14(1), Article 20438087231152848. https://doi.org/10.1177/20438087231152848

254. Nader, K., & Hardt, O. (2009). A single standard for memory: The case for reconsolidation. *Nature Reviews Neuroscience*, 10(3), 224–234. https://doi.org/10.1038/nrn2590

255. Piñeyro, M., Ferrer Monti, R. I., Díaz, H., Bueno, A. M., Bustos, S. G., & Molina, V. A. (2018). Positive emotional induction interferes with the reconsolidation of negative autobiographical memories, in women only. *Neurobiology of Learning and Memory,* 155, 508–518. https://doi.org/10.1016/j.nlm.2018.08.003

256. Porges, S. W. (2011). The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation. *W. W. Norton & Company*.

257. Price, C., & Hooven, C. (2018). Interoceptive awareness skills for emotion regulation: Theory and approach of mindful awareness in body-oriented therapy (MABT). *Frontiers in Psychology*, 9, Article 798. https://doi.org/10.3389/fpsyg.2018.00798

258. Savenkova, I. I. (2018). Psychology of time and individual psychological development [*Monograph*]. Odesa: Astroprint.

259. Savenkova, I. I. (2020). Bifurcation points in the individual biological cycle of humans: A chronopsychological aspect. *Journal of Psychological Research*, 4(2), 115–123.

260. Savenkova, I., Didukh, M., Khazratova, N., & Snyadanko, I. (2019). Psychosomatic unity of human from the position of chronopsycholoqy on the example of ischemic disorders and heart diseases. *Electronic Journal of General Medicine*, 16(6), Article em157. https://doi.org/10.29333/ejgm/114263

261. Savenkova, I., Didukh, M., Khazratova, N., & Voitsekhovska, O. (2020). Chronopsychological forecast of nefrourological diseases. *EurAsian Journal of BioSciences*, 14(1), 2411–2415.

262. Schacter, D. L., & Addis, D. R. (2007). The cognitive neuroscience of constructive memory: Remembering the past and imagining the future. Philosophical Transactions of the Royal Society B: *Biological Sciences*, 362(1481), 773–786. https://doi.org/10.1098/rstb.2007.2087

263. Seth, A. K., & Friston, K. J. (2016). Active interoceptive inference and the emotional brain. Philosophical Transactions of the Royal Society B: *Biological Sciences*, 371(1708), Article 20160007. https://doi.org/10.1098/rstb.2016.0007

264. Stein, M., Rohde, K. B., & Henke, K. (2015). Focus on emotion as a catalyst of memory updating during reconsolidation. *Behavioral and Brain Sciences*, 38, Article e1. https://doi.org/10.1017/S0140525X14000314

265. Tabibnia, G., & Radecki, D. (2018). Resilience training that can change the brain. *Consulting Psychology Journal*, 70(1), 59–88.

https://doi.org/10.1037/cpb0000110

266. Van der Kolk, B. A. (2014). The body keeps the score: Brain, mind, and body in the healing of trauma. *Viking*.

References to section 5

267. Агаєв Н. А., Дикун В. Г., Чорний В. С. та ін. Морально-психологічне забезпечення у Збройних Силах України: *підручник* : у 2 ч. Ч. 1. вид. 2-е, перероб. зі змін. та допов. /за заг. ред. В. В. Стасюка. Бровари: ТОВ 7БЦ, 2020. 754 с.

268. Бондарев, Г. В., Круть П. П. Основи військової психології: *навч. посіб.* Харків: Харків. нац. ун-т внутр. справ, 2020. 272 с.

269. Вавринів О. С., Христук О. Л. Дослідження психоемоційних станів особистості під впливом стресогенних факторів. *Науковий вісник Львівського державного університету внутрішніх справ* (серія психологічна). 2023. № 2, С. 11–15.

270. Гульбс О., Кобець О. Психологічна реабілітація учасників бойових дій. *Вісник Київського національного університету імені Тараса Шевченка.* 2021.

№ 3(47). С. 12–14.

271. Дубчак О. Особливості емоційних станів військовослужбовців нового призову у період адаптації. *Вісник Національного авіаційного університету.* Серія: Педагогіка. Психологія: *зб. наук. пр.* К.: Національний авіаційний університет, 2019. Вип. 2(15). С. 118–123.

272. Гачак-Величко Л.А. Кузик І.Б.. Пирожик А.А. Особливості психічного супроводу військовослужбовців на різних етапах їх військово + професійної\ діяльності. *Габітус.* Випуск 66. 2024. С. 145.

273. Кокун О.М., Агаєв Н.А., Пішко І.О., Лозінська Н.С. Основи психологічних знань про психічні розлади для військового психолога: *монографія*. Київ: НДЦ ГП ЗСУ, 2018. 310 с.

274. Кокун О.М., Агаєв Н.А., Пішко І.О., Лозінська Н.С., Остапчук В.В. Психологічна робота з військовослужбовцями - учасниками АТО на етапі відновлення: *монографія.* Київ: НДЦ ГП ЗСУ, 2017. 282 с.

275. Кокун О.М., Лозінська Н.С., Пішко І.О., Олійник В.О. та ін. Особливості надання психологічної допомоги військовослужбовцям, ветеранам та членам їхніх сімей цивільними психологами: *монографія*. Харків: В-во ЦУЛ, 2023. 176 с.

276. Колесніченко О.С., Мацегора Я.В., Приходько І.І. Протоколи надання першої психологічної допомоги військовослужбовцям Національної гвардії України в екстремальних умовах діяльності: *монографія.* Харків: НА НГУ, 2018. – 40 с.

277. Колк, Бессел ван дер. Тело помнит все: какую роль психологическая травма играет в жизни человека и какие техники помогают ее преодолеть. Киев: Форс Украина, 2020. 464 С

278. Кокун О. М., Пішко І. О., Лозінська Н. С. Особливості надання психологічної допомоги військовослужбовцям, ветеранам та членам їхніх сімей цивільними психологами: *методичний посібник.* Київ : Головне управління морально-психологічного забезпечення ЗСУ, 2023. 175 с.

279. НАТАЛ: Ізраїльський центр травм і стійкості. «Розвиваємо психологічні навички через кризу в Україні»: *посібник для тренера*. 2022. 220с.

280. Організація психосоціальної допомоги ветеранам війни та членам їхніх сімей. *Рекомендації для місцевих органів влади.* Київ: ВАІТЕ, 2021. 32 с.

281. Психологічний супровід особистості в умовах війни: *монографія* / С.Кузікова та ін. Київ– Ніжин : Лисенко М. М., 2024. 260 с.

282. Психологічне забезпечення Збройних Сил України : навч.-метод. посіб. / за заг. ред. В. Клочкова. Київ : НДЦ гуманітарних проблем ЗСУ, 2024. 293 с.

283. Романовська Л. І., Новак М. В. Психологічні умови розвитку життєстійкості особистості в умовах війни. *Наукові записки Нац. ун-ту «Острозька академія».* Серія «Психологія», № 17, 2024, с. 62–66.

284. Неурова А., Романишин А. Психологія індивідуальної роботи з військовослужбовцями: *Монографія.* Харків: В-во ЦУЛ, 2023. 336 с.

285. Психологія бою: посібник / за ред. А. М. Романишина. Львів: Астролябія, 2022. 352 с.

286. Лісовський П.М. Військова психологія. Методологічний аналіз: *навч. посібник.* Київ: Кондор, 2017. 290 с.

287. Петренко В. М., Ляпа М. М., Леганьков І. В. та ін. Організація та методика роботи з особовим складом: *підручник.* Суми: Сумський державний університет, 2020. 414 с.

288. Савенкова І.І. Хронопсихологічне прогнозування психосоматичного стану осіб із особливими потребами: [*монографія*]. Ірина Іванівна Савенкова. К.: Київ. ун-т ім. Б. Грінченка, 2018. 320с.

289. Техніки підтримки. Збірка арттерапевтичних вправ: *метод. посібник*. За редакцією Т. Курганської. Київ: 7БЦ, 2023. 316 с.

290. Цибух Л. М. Робота практичного психолога з підлітками, які пережили психотравмуючі ситуації. Рекреаційна психологія дитинства: теорія і практика.

Колективна монографія. За загальною редакцією С. М. Симоненко. Київ: «Центр учбової літератури», 2017. С. 159 – 184.

291. Цибух Л. М., Кримова О. Роль першої психологічної допомоги під час війни. Сучасні світові тенденції розвитку науки та інформаційних технологій: *Матеріали V Міжнародної науково-практичної конференції* (м. Одеса, 27–28 травня 2022 р.) / ГО «Інститут інноваційної освіти»; Науково-навчальний центр прикладної інформатики НАН України. Одеса: ГО «Інститут інноваційної освіти», 2022. С. 98-102.