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# Ethological and Psychological Aspects of Pantomimic Self-Harming Behavior

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**Funding:** No specific funding was received for this work.

**Potential competing interests:** No potential competing interests to declare.

## Abstract

In the present work, self-injurious behavior of humans and higher animals is considered from the ethological approach. In clinical work, the analysis of patho-psychological disorders and disorders from the point of view of ethological psychiatry (psychology) allows us to understand the nature, pathogenesis and mechanisms of behavioral patterns and pantomimics in patients with borderline and psychiatric disorders. Self-traumatization can be observed in epilepsy, autism, mental retardation, and in accentuated and neurotic adolescents. According to the author's team, body and skin damage is a manifestation of instinctual response. Physical autoaggression satisfies the realization of aggressive instinct, is supported by opioid pleasure from pain and is realized at limitation of direct reaction to negative stimulus. The authors conducted a comparative analysis of the pantomimics of physical autoaggression (self-injury) of 15 adolescents with psychological traumas, 15 children with mental dysontogenesis and 12 monkeys (javan macaques and rhesus macaques). Results of the study showed that experimental primates redirected aggression to their own bodies and limbs in the face of an attack motivation obstacle. Adolescents, in response to the stressor, insected their skin with sharp and stabbing objects. Children with psycho-verbal disorders illustrated primatological forms of self-injury in response to a limiting and negative stimulus. The revealed pantomimic acts of physical autoaggression in experimental monkeys, children with mental developmental disorders, and adolescents with psychotraumatic experience show the commonality and species specificity of the nonverbal pattern of self-injury. In humans and primates, homologs of autoaggressive patterns in pantomimic production are found in nonverbal production. The study may be useful to psychiatrists, neurologists, psychologists, and psychotherapists.

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**Keywords:** ethology, regression, primates, autoaggression, self-harm.

## Introduction

Psychologists and psychiatrists give different explanations for bodily harm. The psychoanalytic direction considers it as a consequence of an intrapersonal conflict between the instinct of self-preservation and self-destruction, interprets "cuts" and "notches" as symbolic writing and representation of what is not represented in the psyche [1]. T. Ogden believes that "autistic touch to the skin" satisfies the need for safety [2]. The authors using J. Bowlby's "attachment theory" show that a violation of the "mother and child" system at an early age of a child is manifested in traumatization of the skin in adolescents and adults [3]. Acts of violence against one's own body are described as a consequence of insufficient self-care. Skin damage is a visual picture of untreated psychological trauma [4]. In the opinion of K. Menninger, the scooter is a form of «partial suicide», which does not allow «total suicide» [5]. M. Hirsch in the aggression of bodily manipulation sees the transformation of the victim into the torturer [6]. Sh. Ferenczi believes it is an autotomia of skin, similar to the removal of horny cover in reptiles [7]. A. Fawazza and K. Conterio classify self-injury in three types, which include pathological forms (castration, amputation), motor pain stereotypes and body injury [8]. Autoaggression, as a consequence of frustration with basic human needs, is described by the American psychologist D. Dollard.

In cultural studies and evolutionary psychiatry, self-harm is considered in religious rituals and group psychoses. And it is found in the self-mutilation of Spartan leaders, self-torture of "needle girls", seppuku of samurai, Hindu taipusam, self-

flagellation of flagellants and shiites, ritual self-wounds, shamanic practices, castration in initiation. Autoaggression is observed in the pantomime production of people, illustrator gestures accompanying human speech. Blows and slaps on one's forehead and body are of the nature of masked self-harm. Some authors attribute piercings and tattoos to self-harm. In our opinion, the adornment of the human body is associated with the demonstration of sexuality and has a homologous nature with the visual bodily signaling of fauna representatives during the mating period [9].

According to Russian and foreign researchers (K. Lawrence, V. Dolnik, V. Samokhvalov, Yu. Shevchenko, J. Fast, H. Calero, A. Stangl, etc.) the tendency to self-harm should be considered as the basis of the aggressive instinct of higher mammalian animals, which include humans. According to ethologists, the basis of instinctive response is the accumulated energy in the nerve centers of the brain, which is temporarily blocked and re-activated with the help of a release device [10]. Innate active-defensive reactions are activated by the amygdala and hypothalamus of the brain and belong to the vital survival programs of the species, are closely related to self-preservation [11]. Aggressive behavior was formed in the process of evolution, natural selection, territorial settlement, motivated food production, reproduction, protection and upbringing of offspring [10]. All herd animals tend to aggression, as it adapts to external environmental conditions and allows them to maintain a hierarchical position in the group. Its individual and group energy accumulation contributes to the development of defensive, dominant, conflict-like behavior in the struggle for one's own and collective survival. A redirected pattern is a form of a biological program to "hit" a negative stimulus, which is satisfied by "splashing" an impulse onto an inanimate object or a low-ranking individual. In the absence of a suitable object for "discharge", aggressiveness is transferred to one's own body. At the same time, physical sensitivity to pain decreases and endogenous opiates are produced [12]. At the same time, self-harm satisfies the realization of an aggressive instinct and is reinforced by opioid pleasure. The pattern is fixed in behavior and implemented with a limited direct response.

Self-gnawing, self-biting, combing, is common in mammals in natural conditions and in captivity. Horses are able to inflict wounds on themselves due to the pressure of the strap wrapped around the neck [13]. Cheetahs and leopard cats bite and chew their own tail in isolation [14]. Minks and ocelots bite and pluck their own skins in closed conditions [15]. Mice and rats are capable of gnawing off their own limbs. Canine puppies bite themselves much more often when they are weaned from their mother than when they are with her. Damage to the body by nails and teeth is observed in primates under conditions of neurogenic stress [16]. Spontaneously developing changes in the species-specific behavior of monkeys, such as an increase in aggressiveness and self-aggressiveness with an increase in displaced activity, are an abnormal form of behavior and manifest themselves in conditions of modeling acute emotional stress [17]. Bites, tearing of the body in anthropoids and lower monkeys, occur with a lack of social and group behavior [18]. The behavior of the baboon Cannon in the Sukhumi Monkey Nursery can be a vivid primatological example of a pathological pattern. The male was brought to breed anubis offspring, and was characterized by pronounced auto-aggressive behavior. Self-biting and tearing of the skin were caused by violation of territorial behavior and low adaptation to new conditions of detention. Physical autoaggression, similar to self-injury in higher animals, is observed in the psychopathology of patients with neuropsychiatric diseases. Behavioral and intellectual disorders often cause mental regression and dysontogenesis, in which archaic forms of reaction are released, having a protective or defensive character [19]. In jactations, self-blows, finger sucking, onychophagy, trichotillomania, patients often reproduce ancestral and pre-ancestral forms of behavior [20].

Autoaggression can be observed in epilepsy, mental retardation, acute stress and borderline mental disorders.

Traumatization of one's own body is observed in stressed and neurotic children in adolescence. Hormonal, personal and physiological changes in adolescents contribute to the emergence of "vivid" instinctive and evolutionary patterns of behavior [19]. Infantile forms of psychological protection, the crisis of growing up increases the risk of destructive and deviant behavior, including towards oneself.

### *The purpose of the study*

A comparative analysis of pantomimic self-injury in adolescents, preschool children with psychiatric dysontogenesis, and primates.

## Materials and methods of research

1. Method for observing the pantomimic behavior of 12 adult rhesus macaque and Javan macaque monkeys (aged 8-20 years) under experimental conditions.
2. The method of observing the pantomime of 15 children with delayed speech development at the age of 3-6 years during consultation with a specialist.
3. A clinical conversation with an analysis of nonverbal behavior on control questions with 15 adolescents aged 12-15 years.

In conducting the research, the authors were guided by the ethical principles set forth in the "European Convention for the Protection of Vertebrate Animals Used for Experimentation and Other Scientific Purposes". The requirements of the biomedical ethics of the Declaration of Helsinki were complied with when performing the study. Voluntary informed consent was obtained for the inclusion of patients in the study.

Primate observations were carried out in the Sukhumi Monkey Nursery of the Institute of Experimental Pathology and Therapy of the Academy of Sciences of Abkhazia. The conversation with teenagers and the supervision of children were carried out in the psychoneurological and somatic departments of the Regional Children's Clinical Hospital named after N.N. Silishcheva in Astrakhan.

## The results of the study

Data on the study of self-harm are given in Table 1.

**Table 1.** *Analysis of the pantomime of self-harm in 12 macaques, 15 adolescents and 15 children*

Respondents	Pantomime	Emotional state and facial expression
Primates	Bites of limbs, throws of the body (itself-gifts) against the wall and floor of the cell, self-inflicted body against the rod of the cell	Expression of anger, less fear
Teenagers	Horizontal, less frequently vertical cutting of the skin of hands and feet with sharp and stabbing objects	Expression of anger, less fear on control questions
Children	Bites of arms and legs, monotonous blows of holo-voos and body on the limiters	Expressed expressions of anger or pathological expressions

The total number of primates to be observed was 36 males, which were conditionally differentiated into a group of depressed, trans and aggressive monkeys. With daily contact (for 10 days) with the experimenter, who approached the cell by 30-40 cm, the subjects showed a whole complex of neurotic and pronounced aggressive actions in nonverbal and verbal behavior. Friendly and contact behavior was absent, defensive and aggressive arousal increased, compensatory, displaced and redirected response patterns, motor stereotypes and threatening and alarming vocalization, etc. Five macaques showed depressive and suffering facial expressions. They visually observed: drooping corners of the mouth, half-closed or lidded eyes, slow or poorly fixed gaze. Postural fading, weakening and decrease in muscle tone, lowering and pressing the head into the trunk, defensive or hypo-activity reactions indicated depression and sadness. In 11 individuals, head and body movements were recorded - a "Chinese dummy", pendulum movements of the trunk and monotonous circular walks around the cage. The trance state of the monkeys was caused by rhythmic stereotypy and stereotypical locomotion. The altered state of consciousness (ASC) was also indicated by characteristic facial behavior: pupil dilation, slow blinking, "glassy" gaze, tearfulness, and masque. Twenty Javanese and Rhesus macaques demonstrated aggressive and threatening signals by mimicry and pantomime to a negative stimulus: half-squint, gaze, yawning, chewing threatening movements of the eyebrows and lower jaw, lunges with the body forward, hand strikes, etc. In the aggressive group of animals, redirected aggression was recorded in 10 monkeys. Self-harm to one's own body was detected in a series of body blows against the bars in five macaques, monotonous head blows against the floor of the cage wall in three, combing to wounds and tearing one's own hair and skin in two individuals. Self-biting appeared against the background of fear in one Rhesus macaque in a group of depressed monkeys. She initially demonstrated depressed psychoemotional and motor activity, stiffness in posture, a facial mask of suffering, shuddered and mechanically bit her hand upon contact with the experimenter. In the group of trance monkeys, the Javanese macaque performed a series of trance pendulum movements with its body, then transmitted anger in facial expressions and performed a series of self-bites of the limbs.

Upon admission to inpatient treatment at the Regional Children's Clinical Hospital N.N. Silishcheva after the lifting of restrictions after COVID-19, a group of adolescent children were found to have multiple skin scarring on their arms and legs. 15 patients (11 girls, 4 boys) aged 12-15 years with more than ten to fifteen incisions on the limbs were selected for diagnostic work. A clinical conversation was conducted with each patient by a medical psychologist. The interview included control questions on the subject of the subject's individual autoaggressive experience and ways of self-improvement. At the first stage of the interview, a positive rapport was built with the help of a sympathetic and friendly attitude towards the teenager. At the second stage, control questions were asked that related to the situation under study. When answering, the psychologist recorded the facial expressions and pantomimes of the respondents. At the third

stage, the conversation was completed with the help of neutral topics and "psychological ironing".

The results of the study of nonverbal behavior and observation of the subjects recorded physiological stress markers on control questions: hyperpiration, descriptors, discoloration (redness/paleness), sweating, changes in voice modulations, etc. Stress gestures were present in pantomime: trans gestures, manipulator gestures, adapters, grooming movements (self-cleansing gestures), which were combined with aggressive kinesics ("clenched fists", "clenching-unclenching hands", "self-blows"). Facial expressions were dominated by expressions of anger on FACS, less often fear. The received verbal data from each patient showed the presence of psychological trauma in the individual experience of the subjects. 11 people indicated conflicting relationships with peers, including bullying in a school or group, all respondents had frequent and prolonged conflicts with relatives, and difficulties in interpersonal communication with peers and adults were found in 12 boys and girls. According to all patients, auto-traumatization helped to get rid of accumulated negative emotions. Negative reactions were associated with aggression and anger, and two children pointed to getting rid of fear and anger. In social isolation due to the pandemic, acts of self-harm have become more frequent due to emerging or escalating relationships with parents. 11 teenagers admitted that they have been making "notches" for more than two years, as they effectively relieve emotional arousal. After traumatization of the skin and bleeding, they felt relief, "inner emptiness", lightness and relaxation. Mechanical actions were performed with stationery knives, a dangerous blade, compasses and other sharp and stabbing objects. 7 of the subjects voiced that they brought cutting objects with them, since they do not exclude the conflicting and negative attitude of their peers towards them during stationary treatment and consider self-harm a way to get rid of their own aggression.

A medical psychologist and attending physicians monitored the behavior of 15 children from 3 to 6 years old with speech disorders and mental retardation. The group was selected based on complaints from parents about the behavior of patients. In the medical history, when patients were admitted to the department for examination and treatment, legal representatives pointed to acts of self-injury and damage (biting, self-blows) of children. During the conversation with the attending physician and psychologist, as well as when observing the child in contact with the mother, it was noted that the negative incentive for the appearance of autoaggression were: the child's refusal to fulfill the parent's desire or request, difficulties in performing some kind of game task, the selection of an adult gadget, a negative attitude towards examination by a specialist, medical consultation. Self-injury in the form of a series of hand bites, less often of the lower extremities, was noted in 6 children. Monotonous and stereotypical head impacts against a wall or an artificial limiter were detected in 9 patients. At the same time, facial behavior expressed facial expressions of anger according to FACS: lowered eyebrows, raised upper eyelids, stretching the head forward, extending the lower jaw, distended nostrils or distorted in pathological facial expressions. The collected clinical history established that autoaggressiveness manifested itself in the behavior of children for a long time and manifested itself with negative emotions and with a negative attitude to a specific stimulus.

The results of a comparative study showed that experimental primates, when approached by an experimenter, experienced anger, less often fear, and demonstrated acts of self-injury of their own body against a cell, used teeth and nails to inflict wounds on their limbs in conditions of resistance and limitation of behavior motivation. The redirected

aggression was caused by the restriction of direct response to a person and the manifestation of threatening and aggressive behavior. Children with mental dysontogenesis, in response to a negative stimulus (mental or physical), demonstrated primatological forms of self-harm, bit their hands and feet, and beat their heads against the floor and walls of the room. Teenagers got rid of negative emotions (anger, less often fear) by redirecting aggression in the form of injury to their own skin with the help of piercing and cutting objects. In humans and animals, the similarity of self-injury was found in pantomime products, which may indicate the homology of self-healing patterns in representatives of the primate class, to which homo sapiens belongs.

## Conclusion

An ethological approach to the nature and mechanisms of aggressiveness considers that it is part of the agonal behavior of all animals, including humans [20]. The benign realization of innate impulses manifests itself in protest attitudes, conflicts and opposition to difficulties (hierarchy, survival). Malignancy consists in pathological forms of manifestation (cannibalism, murder). According to K. Lorenz, any suppression of the impulses of the biological program leads to internal and external suffering [10]. Accumulated aggression in the nerve centers is necessarily realized in the release, even in the absence of a negative stimulus (release). If we consider self-harm to be a form of aggression, then redirecting destructive actions on oneself helps to discharge the accumulated energy affect and is a way to realize this instinct. The nature of auto-destructive actions and actions can be labeled as "abnormal" and pathological as much as necessary, but one should take into account the fact that as a result of heredity, variability and evolutionary selection, various response patterns, including non-specific ones, were created. Any behavioral strategy of a species or individual solves an adaptive or protective task; in psychopathology, this reaction is more distorted, but retains its adaptive role [19]. The pantomimic acts of physical autoaggression of experimental monkeys, children with impaired mental development, and adolescents with traumatic experiences revealed by us show the generality of the nonverbal pattern of self-injury. In adolescent self-harm, the zoopsychic and phylogenetic projection of one's own "teeth and nails" on sharp and stabbing objects is differentiated. The ethological analysis of pathopsychological forms of pantomime allows us to understand their nature, pathogenesis and mechanisms of occurrence in the behavior of patients with borderline and mental disorders and can be useful to psychiatrists, neurologists, psychologists, psychotherapists.

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