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NEUROPSYCHOLOGICAL AND FAMILY FACTORS CONDITIONING ANOREXIA NERVOSA

Teresa Rostowska^{1(A,B,C,D,E,F)},

Jan Rostowski^{2(A,E,F)},

Aleksandra Lewandowska-Walter^{1(C,D,E)}

¹ Institute of Psychology, University of Gdańsk, Gdańsk,
Poland

SUMMARY

Background:

Recent research into anorexia nervosa suggests that it results from an interaction between genetic, neurohormonal and environmental factors. The aim of our study was to analyze the mutual relationships between the respective parental roles of mothers and fathers and the aggressive behavior displayed by girls with anorexia nervosa.

Material/ Methods:

We studied 20 girls with anorexia, outpatients of psychiatric hospitals in Gdańsk and Lublin, along with a control group of 30 healthy girls matched for age. All subjects completed a preliminary questionnaire and three psychological questionnaires: the Eating Disorder Inventory, the "Emotional Reactivity" questionnaire of adolescent aggression, and the Parental Role Scale.

Results:

Both mothers and fathers of anorexics use parenting strategies that gradually erode the girls' sense of autonomy in personal matters, especially the mother. We also observed a number of interesting relations concerning the relationship between parental attitudes and the girls' displays of aggression, and superficial functioning (with stifled display of emotion) in the families of anorexics.

Conclusions:

Our results confirm the importance of the environmental factor in the development of symptoms. Once a diagnosis is achieved, therapeutic work involving the entire families of those affected is necessary. Those results which reveal emotional suppression as a stress-coping mechanism testify to the need for patient therapy in the context of the patient's individual predispositions, at least partly conditioned by neurohormonal factors. Therefore the most effective method would seem to be combined individual and family therapy.

Key words: eating disorders, aggressiveness, parental roles, suppression of emotion

INTRODUCTION

For many decades anorexia nervosa (AN) was treated mainly as a mental illness. The most recent results from studies on the conditioning factors and course of this disease suggest that this opinion was not fully justified. There is much evidence, confirmed in empirical studies, that at the base of this illness lie genetic, neurohormonal, and environmental factor.

Anorexia nervosa is an eating disorder, connected with the occurrence of a number of characteristic symptoms, such as distortion of perceived body image, abnormal perception of inner sensations, exteriorization of the sense of control (despite directing attention inwards, onto one's own sensations), ineffectiveness of action, a tendency to act submissively, obsessive perfectionism, lack of interpersonal trust, and fear of sexual maturity. As the illness escalates, the patient may experience depression, anxiety, excessive interest in weight loss and becoming thinner, and constant fear of gaining weight, which may lead to many endocrinological dysfunctions. Food intake disorders and the resulting lack of nutrients, vital for the correct functioning of the organism, especially in the period of intensive growth and maturation, interrupt the somatic and psychological development process, causing serious health and social-psychological complications and contributing to the high death-rate of patients suffering from this disease. As research has shown, anorexia nervosa disorders are essentially the result of a complex interaction of various biological, psychological, and socio-cultural factors (Houy et al., 2007; Naruo et al., 2001; Goethals et al., 2007; Bastiani et al., 1995; Harding, Lachenmeyer, 1986).

One should not forget, however, that human behavior, as well as our perception of surrounding reality and ourselves, also has its source in the social environment (especially the family), individual psycho-physical predispositions, and currently also the mass media.

The complex clinical image of this illness, as well as its various conditioning factors and consequences, despite many studies in this area, has not been sufficiently explained and require further empirical research. In light of the dynamic development of genetics and the biochemistry of the human brain, we should expect the etiology of this illness to be explained precisely in the not-too-distant future.

The symptoms listed above as accompanying anorexia nervosa indicate that the illness involves the somatic, cognitive and social functioning of those affected. An analysis of the literature presented in this article, as well as the results of the authors' own studies, delivers empirically verified evidence in favor of the diverse character of the factors causing the illness, especially the genetic and neuropsychological factors, as well as family-related factors contributing to the development of anorexia nervosa.

The genetic approach to Anorexia nervosa

When considering the neurobiological factors contributing to anorexia we need to take into account the participation of genetic factors, both direct and indirectly inherited. Studies in the field of behavioral and molecular genetics indicate a high level of heritability in anorexia nervosa, ranging from 0.58 – 0.76, with 0.70 being the average value. Based on this data we can regard the heritability indicator of anorexia nervosa as very high (Ben-Dor et al., 2002; Klump et al., 2001; Kipman et al., 1999).

The mental disorders connected with anorexia nervosa constitute a complex illness, conditioned by environmental factors, and most of all by numerous genes. Each gene contributes to a genetic component of this disorder independently, through an interaction with another gene, or through one or many genes interacting with each other, as in the case of alleles (Urwin et al., 2005). However, it needs to be highlighted that the creation and occurrence of an anorexia syndrome is mainly influenced by genetic and non-shared environmental factors, as well as other factors participating in polygenetic inheritance. This mostly concerns the dominance and recessiveness of genes constituting a pair in a given chromosome. Even greater influence can be attributed to the phenomenon of epistasis, i.e. the existence of a specified position of a given gene in alleles, or groups of genes responsible for the inheritance of a specific feature, and even more so of a specific syndrome, such as for example anorexia nervosa, the shape of which can be influenced by several dozen or even several hundred genes. Not without significance for the process of inheriting anorexia nervosa is polymorphic inheritance, i.e. inheritance somewhat common for many factors, similar in structure and partly in function, e.g. neurotransmitters, which co-operate harmoniously, yet sometimes agonistically or antagonistically (e.g. dopamine, serotonin, norepinephrine, opiates). Also important in this respect is inheritance on the basis of intergenerational transmission, sometimes reaching the second or even further degree of kinship in the family. Such processes occur during the genetic inheritance of anorexia nervosa, and explain most of all the susceptibility to the appearance of this disease, as well as the diversity of symptoms and subtypes of the occurrence of the anorexia nervosa (AN) syndrome, i.e. restrictive anorexia (ANR) and bingeing- purging anorexia (ABN), or more precisely bulimia nervosa (BN) (Dardannes et al., 2007; Bergen et al., 2003; Pinheiro et al., 2009; Gorwood et al., 1998; Gabrovsek et al., 2004; Pieri, 1999).

Genetic factors contribute to the occurrence of a diverse AN syndrome in various areas or domains of the individual organism in an indirect way, and only in co-operation with environmental factors – especially the family environment. This concerns most of all the development and shaping of various structures and the functions of the central nervous system and neurohormonal system, as well as the psychological, behavioral, and somatic system connected with these structures. It is within the somatic sphere that studies more frequently account for negative and often irreversible effects in the

scope of the circulatory system, changes in the skeletal system, changes in the brain and neurohormonal structure, not to mention the digestive and behavioral systems. On the other hand, studies of the mental sphere are usually limited to the occurrence of disorders in the phenomenological perspective, or based on the self-description of an anorexic person without deeper analysis of more essential, generic disorders, with their source in the brain, or in disorders of the perceptive-cognitive processes, regulation of emotions, as well as temperament, personality, and most of all relations in the family. It is bioneuropsychology that deals with such problems. A devastating diet that deprives the organism of substances essential for its proper functioning, such as sugars, fats, proteins, vitamins, macro- and microelements is very dangerous, and may lead to disordered functioning of the nervous system, circulatory system, immune system, endocrinological system, excretory system, skeletal system and muscle system. For example, the lack of microelements necessary for the correct functioning of the heart (calcium, potassium, sodium) causes heart failure, while an organism deprived of proteins, sugars and fats cannot create immune cells or antibodies, or rebuild other cells, tissues and organs. As a result of the lack of energy necessary to live, the organism burns the existing energy resources, which soon leads to self-destruction. In the context of these considerations we can state that the genetic basis predisposes an individual to greater sensitivity and susceptibility to react to important family and social experiences, which negatively or in a conflicting and incoherent way affect the shaping of one's self-image, self-esteem, and effectiveness (Kaplan, 2005; Bulik et al., 2007; Favaro, Santonastaso, 2000; Strober, Humphrey, 1987).

The neurobiological perspective of studies on Anorexia nervosa

In the proper diagnosis and therapy of anorexia nervosa the role of brain structures and functioning is of key significance. This mostly concerns those centers responsible for regulating energy homeostasis, important for maintaining life, health and a proper level of individual activity. Damage to these centers, as well as incomplete development or inadequate functional operating, may lead to eating disorders (ED), loss of appetite, excessive craving and gluttony. In the case of limitations of food intake we are dealing with anorexia nervosa, while excessive food intake and its excretion signifies an illness called "bulimia nervosa." The consequent disorders in the balance between energy intake and use leads not only to somatic-physiological disorders, but also to disorders of a psychiatric or psychological nature. So far the mechanism of this type of disorder and its contributing factors have not yet been satisfactorily explained, despite intensive research. An important role in these disorders is played by two hypothalamic nuclei, which seem to be responsible for maintaining the basic homeostasis of body weight. According to the dual center model, the lateral hypothalamic nucleus is the "feeding center," while the ventromedial nucleus is the satiety center. The activity of

these centers is mostly conditioned by the relevant neurohormones, i.e. leptin and melanocortin, respectively. This activity of the hypothalamus is connected, through numerous nerve pathways, with the functioning of other limbic system centers, especially the amygdala, and most of all the cerebral cortex, and even the spinal cord. The occurrence of anorexia nervosa is related to a disorder of neuronal equilibrium in nearly all of the limbic system (Kishi & Elmquist, 2005; Chowdbury et al., 2004; O’Rahilly et al., 2004).

In humans, an important role in feeding behavior can be attributed to structures of the cerebral cortex. Based on the results of studies using regional Cerebral Blood Flow (rCBF) and various techniques of functional Magnetic Resonance Imaging (fMRI), numerous and very important structures of the brain cortex have been singled out as probably responsible for the appearance of the key symptoms of anorexia nervosa. When considering disorders we should focus on those brain structures which are activated in healthy people in connection with food intake, i.e. the central prefrontal cortex, frontal cingulate cortex, and right lateral prefrontal cortex. In the case of people with AN there is a significant decrease in blood flow in the anterior parts of both cingulate gyri (ACC) and anterior parts of the frontal lobe areas bilaterally. On the other hand, a higher level of activation among these patients takes place in the junctions of the left insula, striatum, frontal and parietal lobes, and left frontal gyri. These facts suggest that the brains of patients suffering from anorexia nervosa display significant changes in the scope of functioning, in comparison to healthy people. An important piece of evidence proving this, among others, is a clear decrease in metabolism in the anterior parts of frontal lobes, parietal lobes, occipital lobes, and cerebellum, i.e. generally speaking changes in the metabolism of the brain, as well as light changes in white and grey matter, caused mainly by the lack of protein and fat components, resulting from malnutrition and loss of body weight, as well as by accumulation of water and increased cerebrospinal fluid in the ventricles. In some regions of the cortex, particularly in the anterior parts of the frontal lobe, occipital lobe, and especially in specific parts of the anterior cingulate cortex we can also observe a loss in grey matter, directly related to the degree of severity in cases of AN – approximately 1%. This fact indicates the great significance of these areas, particularly the anterior cingulate cortex, which is the probable location of certain important functions involved in the pathophysiological aspects of disorders typical for AN. The anterior parts of the cingulate cortex are connected with the processing of somatic-sensory stimuli before their realization, and also constitute the neuronal basis for feelings and emotions connected with the insular cortex, secondary somatic-sensory cortex and the hypothalamus, especially fear, unease, anxiety, and other emotions typical for AN. These areas are very important for controlling many higher-level brain functions. That is why a disorder in these areas may cause serious disturbances in the process of correct perception and understanding of many stimuli, processes, and phenomena among patients with AN, espe-

cially those concerning the image of one's body and behavior, as well as control of emotions. In the course of these disordered processes, mostly cognitive in character, an important role is assigned to incorrect functioning of the prefrontal areas, particularly the central prefrontal cortex. Certain losses in grey matter have also been observed in subcortical areas, mainly the thalamic area. On the other hand, in the case of anorexic patients with bulimia (AN-BN), there often occur changes in the lower and higher prefrontal and parietal areas of the right hemisphere, which is significant, because as a result of these changes the patients in question do not attach much importance to recognizing and understanding the process of food intake in terms of quantity and quality. Changes in the brain and the occurrence of the AN syndrome may also be caused by brain tumors. Generally speaking, in the light of current research, it can be assumed that the structures of the right hemisphere are connected with AN disorders to a larger extent (Muehlau et al., 2007; Houy et al. 2007; Goethals et al., 2007; Naruo et al., 2001; Naruo et al., 2000; Karen & Katzman, 2003; Roser et al., 1999; Uher et al., 2003; Redgrave et al., 2008; Grzelak et al., 2005; Sieg et al., 1997; Chipkevitch, 1994; Kave et al., 2009).

Disorders in brain functioning connected with AN not only involve the neurological and physiological-somatic sphere, but also disorders in the scope of cognitive and behavioral aspects of individual functioning. Disorders in the region of the right frontal cortex cause distortions in the body image through changes in the processes necessary for the assessment of one's own appearance. Furthermore, disorders in this brain structure seem to be responsible for the complex set of behavioral traits typical for AN (Chui et al., 2008; Wagner et al., 2008; Houy et al., 2007; Katzman et al., 2001).

When speaking of the neural factors involved in anorexia nervosa, one cannot omit distortions in the emotional sphere. Among the characteristic symptoms attendant upon this disease, apart from fear of gaining body weight, are increased states of unease or even fear, obsessive-compulsive personality disorders, and disorders of a depressive character. What is more, the behavior of anorexic women is characterized by social and simple phobias (e.g. agoraphobia, etc.) or using inadequate strategies of coping with stress. Often common symptoms include excessive arousal, alertness, and hyperactivity, as well as a tendency towards impulsive behavior, including aggression, fits of rage, and even hostility. Patients with restrictive anorexia (without a co-occurring bulimia) show tendencies towards impulsive behaviours, defensive mechanisms, and self-control behaviors, which are often internalized, i.e. experienced internally, without being manifested outside, and thus suppressed. This contrasts with bulimic patients, whose fits of aggression can be characterized by self-aggression, including attempting suicide. The illness in question can be accompanied by a feeling of weariness, tiredness, and especially co-occurring depression, which in turn is related to using stimulants. These forms of behavioral disorder are to a large

extent conditioned genetically and neurohormonally, mainly through a suitable level of serotonin, dopamine, and norepinephrine (Bizeul et al., 2003; Strober et al., 2007; Pompili et al., 2003; Horesh et al., 2000; Geller et al., 2000; Hoefling et al., 2001; Nakao et al., 1998).

Family-related factors in Anorexia nervosa

The results of previous studies have drawn attention to the way in which the parents of anorexic children react. It turned out that mothers were usually described as intrusive, overprotective, anxious, perfectionist, and fearful of being separated from their children. Fathers, on the other hand, were described as constricted, obsessive, moody, withdrawn, passive and ineffectual. In the context of these types of parental behaviors, anorexic girls experienced difficulties in separating from the family, and in shaping and strengthening a separate, individual identity. The fathers' high level of protectionism, or rather over-protectionism, turns out to be important in this respect; however, the same significance is attributed to the father-daughter relation, as well as to a higher level of parental expectations. Dramatic events in the family in the early period of the child's life, such as premature birth and perinatal complications, or in later years, such as molestation or more drastic sexual abuse, as well as parental conflicts, excessive criticism, lack of mutual loyalty, and sometimes open hostility or control, also with regard to the child, can have a major impact on the development of anorexia nervosa. However, significant psychological research on the influence of the family environment on the course of anorexia nervosa were essentially started in the scope of family system theory by Minuchin (1978), when it was noticed that the sources of the disorders lay in the dynamics of family functioning, its structure, and the forms of affective expression among family members. As a result of his research he singled out the five basic models of disordered interactions, which form the basis of the psychosomatic pathologies of the AN type: enmeshment, over-protectiveness, rigidity, conflict avoidance, and poor conflict resolution. Within the framework of this theory, symptomatic behavior and family processes were basically examined together in a self-regulating cycle, which minimized the possibilities of conflict and change. Significant influence is attributed to the perception of family functioning, as well as to the assessment of the family members' attitudes, particularly the parents' attitudes towards important aspects of family life, by the individual suffering from AN (Favaro & Santonastaso, 2006; Murphy et al., 2000; Shugar & Kruger, 1995; Strober & Humphrey, 1987; Emanuelli et al., 2003; Wade et al., 2007; Wolska, 2004; Kyriacou et al., 2008).

The families of children with eating disorders display large discrepancies between affiliation and the lack of affiliation, and similarly between independence and co-dependence, dependence and insecurity, support and submissiveness, excessive attachment and involvement or lack of attachment, or even rejection, and between affect and empathy. The parents are perceived as mutually antagonistic, attacking, neglecting, less attentive, not really car-

ing and not very open. According to data that is usually of a descriptive character, anorexic disorders remain related to:

- dysfunctional family relations, with family environments being perceived as more susceptible to conflicts, less coherent, caring and involved, sometimes in a state of chronic discord, far-reaching alienation of feelings, excessive harshness, often an extreme restriction of autonomy, restricted or disordered;
- styles of communicating in the family, e.g. cool and emotionless, without love, sympathy or empathy;
- more frequently occurring alcoholism.

An important role in this scope is attributed to family transmission. As mentioned earlier when discussing genetic factors, AN dysfunctions occur in families and may involve, its members or relatives to a greater or smaller extent (even over 12%, and to a much larger extent in the case of first degree affinity). This concerns not only eating disorders, but also psychiatric problems, such as depression, schizophrenia, personality or social behavior disorders, including alcoholism. Thus it turns out that although AN related disorders have their source in the genetic background and are subject to various traits of personality and temperament, their final manifestation requires the additional presence of disorders in the scope of family interactions or other social pressures (Dimitropoulos et al., 2008; Krug et al., 2009; Wade et al., 2007; Karwautz et al., 2003; Strober & Humphrey, 1987; Shugar & Krueger, 1994; Strober et al., 2000; Emanuelli et al., 2003; Fornari et al., 2001; Rostowska, 1995; Felker & Stivers, 1994).

MATERIAL AND METHODS

In attempting to explain human behavior in the context of the genetic-evolutionary approach, one needs to assume that, just as people have genetically conditioned and evolution-based needs to assuage hunger and thirst, so in the same way they possess a need to have and maintain a satisfying level of securing and gratifying social relationships. Satisfying this need at all stages of human phylogeny and ontogeny is directed at opposing, counteracting, and protecting from the negative effects of rejection, social isolation, and in extreme cases ostracism, which is a source of pain of the same significance as physical pain, for it activates the same structures of the brain, i.e. mainly the insular cortex. Sadly, an individual may encounter the problem of emotional rejection also in the family, which by assumption should provide them with a sense of security (Rostowski 2008; Rostowska 2008; Taylor & Gonzaga, 2007). Irregularity in the relations between parents and children may generate many negative emotions and undesirable behaviors, consequently determining the health state of those directly or indirectly involved in the conflict, as well as the quality of life of the entire family system.

The object of our study was to examine the mutual relations between the parental attitudes of mothers and fathers and aggressive behavior in girls suf-

fering from anorexia nervosa. An analysis of the literature indicates that despite the evident relationship between cognitive and behavioral symptoms of aggression and eating disorders, few studies have examined this relationship empirically (Grochmal-Bach et al., 2009; Tiller et al., 1994; Miotto et al., 2008). Most reports taking into account the issue of aggressive behaviors have focused more on the functional specificity of the families of people diagnosed with anorexia nervosa. They have confirmed clinical observations, which indicated that family systems with a member suffering from anorexia are characterized by striving to maintain a facade of high cohesion and lack of family conflicts (Minuchin, 1978, Lewis & MacGuire, 1985, Kog & Vanderlinen, 1995; Shugar & Krueger, 1995). This objective may be achieved by parents displaying the attitude of protecting and restricting the child's autonomy.

The present study was intended to provide answers to the following research questions:

1. Are there differences between girls diagnosed with anorexia nervosa (experimental group) and healthy controls in respect to their perception of the parental attitudes of their mothers and fathers?
2. Is there cohesion between the parental attitudes of mothers and fathers, as perceived by AN girls and healthy controls?
3. Is there a relationship between parental attitudes and aggressive behaviors in the experimental and control groups?

We examined 20 girls suffering from mental anorexia, all outpatients from psychiatric hospitals in Gdańsk and Lublin. The control group consisted of 30 healthy girls of similar age. Before the respondents were asked to fill out the interview questionnaire and three psychological questionnaires, they were informed of the scientific, anonymous character of the research. The following tools were implemented in the studies:

Interview questionnaire

The questions included in the questionnaire referred to demographic variables, such as the respondents' age and the structure of the family of origin. The questionnaire for the experimental group also contained questions concerning the duration of the illness and the number of hospitalizations since the diagnosis of AN.

EDI (Eating Disorder Inventory)

The EDI is used to study eating disorders, i.e. symptoms of bulimia and anorexia. The heterogeneity of eating disorders has brought the EDI into wide use, since it gives a greater chance of detecting people who are especially at risk for eating disorders. The inventory consists of 64 statements, grouped into the following scales:

- *Drive for Thinness* – the degree of concentration on becoming slimmer;
- *Bulimia* – the tendency to experience overeating fits, though high results are not strictly tied to eating disorders;

- *Body Dissatisfaction* – being dissatisfied with the shape of those parts of the body of particular importance for people suffering from eating disorders (abdomen, thighs, buttocks);
- *Ineffectiveness* – a low degree of self-acceptance and a low sense of control over one's own life;
- *Perfectionism* – demanding perfection from oneself, and the conviction that others demand it as well;
- *Interpersonal Stress* – alienation and no will to create close interpersonal bonds,
- *Interoceptive awareness* – the extent to which one is lost in the correct assessment of one's own emotional states;
- *Fear of Becoming an Adult* – the desire to go back to childhood and recover the lost feeling of security.

The first three scales describe attitudes towards eating and body weight, and behaviors connected with these factors. The other five scales describe psychological and clinical characteristics of eating disorders (Garner, 1991).

The Adolescent Aggression Questionnaire – Emotional Reactivity

This tool, designed by U. Sajewicz-Radtke and B. M. Radtke (2006), consists of 60 statements, arranged into 5 scales:

- *Direct Aggression (B)* – consisting, as the name suggests, in a direct attack on a selected object that is seen as a source of frustration;
- *Indirect Aggression (P)* – an indirect attack against a specified person, consisting in distressing and behaving in such a way as to offend them;
- *Irritability (D)* – behavior characterized by a high level of frustration, which causes constant tension and accumulation of aggression;
- *Resistance (O)* – all forms of behavior expressing opposition and resistance to authority and power;
- *Verbal Aggression (W)* – displayed through shouting, cursing and lying (Sajewicz-Radtke & Radtke, 2006).

The Parental Attitude Scale (Skala Postaw Rodzicielskich – SPR-2)

The Parental Attitude Scale by M. Plopa consists of two versions, used for retrospective assessment of the attitudes of the mother and father. Each version includes 50 statements, to which the participants respond by selecting an answer on a five-degree scale, ranging from “he/she was definitely like that” to “he/she was definitely not like that.” The questionnaire comprises five dimensions: Accepting/Rejecting, Exceedingly Demanding, Autonomy, Inconsistency, Over-Protecting (Plopa, 2006).

Study Group

The study involved two groups of girls: 20 girls diagnosed with AN and 30 healthy girls. An analysis of the demographic variables was applied to age and family structure. The studied groups did not differ significantly regarding

age ($\chi^2 = 3.1250$; $p = 0.210$, n.s.). A more detailed analysis of the data concerning the respondents' age showed that the majority belonged in the age bracket 15-17 years (60% of the AN girls and 40% of the healthy girls). A large number of girls fit in the age bracket 12-14 years (25% of the AN girls and 50% of the healthy girls). The remaining 15% of the AN girls and 10% of the healthy controls were between 18 and 19 years of age. Family structure turned out similar in both groups. The data subjected to statistical analysis indicated that the experimental and control groups did not differ significantly regarding this variable ($\chi^2 = 4.502$; $p = 0.212$, n.s.). Most of the girls – 70% of the AN girls and as many as 90% of the healthy controls – were brought up in complete families. The next group according to size were girls from divorced families – 15% and 6.67% respectively. The remaining girls – 5% and 3.33% respectively – were brought up by a single parent.

RESULTS

The first step in the process of compiling data was a comparative analysis of the results achieved by members of the experimental group (girls diagnosed with AN) and the control group (healthy girls) in the scope of behaviors and attitudes occurring in eating disorders. The analysis of data presented table 1 indicated differences in six out of eight dimensions included in the EDI. The AN girls significantly more often concentrate on diet, their body weight, and the tendency to maintain a slim figure ($t = 5.46$, $df = 48$, $p < 0.001$). Thus it can be said that the AN girls did not accept their own bodies, or parts of them, to a larger degree than the healthy controls ($t = 3.63$, $df = 48$, $p < 0.001$). Other dimensions in which the two groups differed involved selected aspects of social functioning.

Tab. 1. Differences in behaviors and attitudes occurring in eating disorders between the experimental and control groups

	AN Girls n = 20		Healthy Girls n = 30		T	df	p <
	X	SD	X	SD			
Drive for Thinness	12.25	7.55	3.37	3.92	5.46	48	0.001
Bulimia	2.50	3.66	1.43	2.39	1.25	48	0.22
Body Dissatisfaction	10.85	6.19	6.00	3.23	3.63	48	0.001
Ineffectiveness	10.95	6.25	3.47	3.91	5.21	48	0.001
Perfectionism	8.85	4.37	4.87	4.01	3.32	48	0.001
Interpersonal Stress	7.20	3.02	3.73	3.61	3.54	48	0.001
Interoceptive awareness	5.55	4.35	3.23	3.20	2.17	48	0.03
Fear of Becoming Adult	8.55	6.29	7.77	4.03	0.54	48	0.59

The AN girls had significantly higher results than the healthy controls in respect to insecurity and lack of control over their lives ($t = 5.21$, $df = 48$, $p < 0.001$). They were also characterized by a higher level of expectations in respect to their own exceptional achievements ($t = 3.32$, $df = 48$, $p < 0.001$), they avoided involvement in close relationships with other people ($t = 3.54$, $df = 48$, $p < 0.001$), and what is more important, they reached a higher level of awareness of stimuli coming from their own body ($t = 2.17$, $df = 48$, $p < 0.03$) (see Table 1). These differences confirm the clinical diagnosis and allow for further analysis concerning the comparison of the family environment of the two groups, which is a crucial issue in the present study.

In order to obtain answers to the first two research questions (1. Are there differences between girls diagnosed with anorexia nervosa (experimental group) and the girls from the control group (healthy) in their perception of the parental attitudes of their mothers and fathers? and 2. Is there cohesion between the parental attitudes of the mothers and fathers, as perceived by AN girls and healthy controls?), we conducted intragroup (question 1) and intergroup (question 2) analyses. The analysis of results concerning perceived parental attitudes in the two groups suggests a clear similarity in the perception of both mothers' and fathers' attitudes. The two groups differed significantly in the area of allowing the child to act freely, displaying independence (mothers: $t = -.01$, $df = 48$, $p < 0.05$; mean = 31.10, SD = 8.91 vs. M = 36.13, SD = 8.57; fathers: $t = -2.41$, $df = 48$, $p < 0.02$; M = 29.20, SD = 7.03 vs. M = 34.67, SD = 8.34).

Both the mothers and fathers of the AN girls brought them up in a way leading to a systematic decrease in their sense of autonomy.

Tab. 2. The relationship between parental attitudes and aggressive behaviors in the group of girls diagnosed with AN

AN girls	Acceptance_F	Demanding_F	Autonomy_F	Inconsistency_F	Protecting_F	Acceptance_M	Demanding_M	Autonomy_M	Inconsistency_M	Protecting_M
Direct Aggression (B)	-.05	-.00	-.04	-.06	-.39 ^a	-.10	.20	-.18	.20	.27
Indirect Aggression (P)	-.50*	.46*	-.44 ^a	.39 ^a	-.48*	.07	.08	.15	.09	.17
Irritability (D)	.07	.01	.05	-.02	-.03	-.24	.28	-.28	.29	.18
Resistance (O)	-.43 ^a	.51*	-.57**	.48*	-.37	-.32	.46*	-.25	.31	.44 ^a
Verbal Aggression (W)	-.25	.36	-.25	.23	-.10	-.28	.48*	-.19	.45*	.18

M – mother; F – father; ^a $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Tab. 3. The relationship between parental attitudes and aggressive behaviors in the group of healthy controls

Healthy Girls	Acceptance_F	Demanding_F	Autonomy_F	Inconsistency_F	Protecting_F	Acceptance_M	Demanding_M	Autonomy_M	Inconsistency_M	Protecting_M
Direct Aggression (B)	.01	.33A	-.00	.35A	.25	-.41*	.53**	-.53**	.55**	.11
Indirect Aggression (P)	-.11	.45*	-.10	.46*	.10	-.32A	.53**	-.33A	.62***	.14
Irritability (D)	-.24	.42*	-.24	.57***	-.03	-.40*	.52**	-.51**	.61***	.07
Resistance (O)	-.11	.39*	-.04	.50**	.13	-.43*	.58***	-.48**	.71***	.14
Verbal Aggression (W)	-.14	.45*	-.10	.50**	.09	-.37*	.64***	-.47**	.63***	.15

M – mother; F – father; ^a p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001

Intragroup comparisons concerning the coherence of mothers' and fathers' attitudes indicated statistically significant differences only in the Protecting dimension. It turned out that the mother is the parent who excessively interferes in the daughter's personal problems, wants to know everything and to give advice. Mothers display this to a greater degree than fathers both in the case of the healthy controls ($t = -3.05$, $df = 29$, $p < 0.005$, $M = 34.67$, $SD = 7.21$ vs. $M = 30.43$, $SD = 7.98$), and the AN girls ($t = -3.97$, $df = 19$, $p < 0.001$; $M = 36.55$, $SD = 5.07$ vs. $M = 30.05$, $SD = 5.08$).

The aim of the final step of the analysis of results in respect to the psychological variables discussed above was to obtain an answer to the following question: Is there a relationship between parental attitudes and aggressive behaviors in the experimental and control groups? The results presented in tables 2 and 3 show many interesting dependencies, both in the case of the healthy controls and the girls diagnosed with anorexia nervosa.

In the group of girls suffering from anorexia more statistically significant correlations, or correlations reaching the level of tendencies, were obtained in the scope of parental attitudes of the father and aggressive behavior of the daughters. An intensification of excessive demands, as well as inconsistency in dealing with the child, may result in an increase in the number and force of signs of indirect aggression and resistant behavior among girls.

A lower tendency to unconditionally accept the child as a person, and its choices, as well as denying the daughter freedom to independently seek solutions to her own problems, remains in relation to the signs of aggression mentioned above. Also interesting is the result showing that the lower the inten-

sity of the excessively protecting attitude on the part of the father, the higher the tendency among the AN girls to express indirect and direct aggression.

There are few dependencies in the groups between the mother's attitudes and the girls' aggressive behavior. Only perceiving the mother as a person demanding absolute obedience and that the rules established by her are followed remains in relation to the resistant behaviors of the daughters and to their verbally expressed aggression. Afflicted girls are also in opposition when mothers display inconsistency in dealing with them, while the intensification of verbal aggression remains related (on a tendency level) with that parent's overly-protective attitude.

In the case of the healthy girls, statistical analysis revealed more dependencies between the dimensions in question (parental attitudes and aggressive behavior) in the mother-daughter dyad. The larger the intensity of positive parental attitudes towards the child – granting her autonomy and accepting her as a person – the less manifestations of aggression in each form. On the other hand, an increase in the strength and manifestations of the mother's negative attitudes increases the daughters' tendency to react in an aggressive way. An analysis of the relationships in the father-daughter dyad allows us to state that healthy girls demonstrate a tendency to intensify aggressive behaviors when fathers persist in their demanding attitudes, as well as in the case of parents' inconsistency in dealing with the child.

Also interesting is the comparison of the number of statistically significant dependencies in both groups. It turns out that in the case of healthy girls there are more correlations between parental attitudes and manifestations of aggression on the part of the daughters, which could confirm the impression that the functioning of families with AN girls is a facade.

DISCUSSION

The results we obtained are consistent with previous reports concerning parental attitudes in families, in which one member of the children's subsystem is suffering from eating disorders. As perceived by the daughters, both parents of AN girls participating in the present study turned out to display a reluctance to allow for the girls' growing need for autonomy, "experimenting" with making independent decisions, along with their consequences. They were perceived as imposing their will, showing little flexibility in new and difficult situations, and firm, when the child's behavior deviated from the rules adopted by the family. This confirmed the assumptions made by Minuchin (1978), whose model described anorexia as a disorder resulting from a dysfunction in the family, characterized by strictness in obeying rules, excessive control over the child (protecting and restricting autonomy), and lack of competence in the scope of communication, which made coping with conflicts and solving problems difficult. Józefik & Ulasińska (1999) describe anorectic families as "centripetal," pointing at such traits as strong bonding, with restricted autonomy and difficulties regarding defining of one's own identity.

More current reports have also indicated these traits as characteristic for families with a child diagnosed with anorexia nervosa (Tiller et al., 1994; Shugar & Krueger, 1995; Francis & Birch, 2005; Józefik, 2006).

In reply to the second research question, concerning parental attitude coherence, the results shown here attest to a protecting attitude with regard to the daughters, significantly more displayed by mothers than by fathers. This may show the strength of the mother-daughter relationship, and the influence that the parent of the same gender can have on the child's attitudes and behavior. In view of reports indicating that the mothers of girls suffering from anorexia display more problems of their own than the mothers of healthy girls, this result can be alarming. When attempting to explain this dependency in the context of family systems theory, one may consider the function of the symptoms of the daughter's illness regarding the mother, and reach a conclusion as to the mutual strengthening of the intensity of both women's problems, in accordance with the feedback principle (Von Bertalanfy, 1984). Our own clinical observations confirm the existence of a strong symbiotic bond between the mother and the afflicted daughter, who both find it difficult to reveal their own problems, and the resulting negative emotions. Perhaps the period of the daughter's growing up and individualization can be particularly difficult for the mother, who may find herself facing an "empty nest" after the daughter leaves the family home, and she will have to stop fulfilling the mother role, which gave her satisfaction, especially in light of the emotional distance in the spouse dyad, frequent in anorectic families. It was observed that in families facing the problem in question children have a special position and being a parent is of superior value, thus belittling the partner relation (Minuchin, 1978; Sim et al., 2009; Strober & Humphrey, 1987; Selvini-Palazzoli & Viaro, 1988).

Our study revealed few dependencies between parental attitudes and manifestations of aggression among afflicted girls in relation to healthy girls. This result is consistent with reports indicating that a characteristic feature of families with an anorectic child is low tolerance for conflict, which the family members deal with by maintaining a facade of harmony (Shugar & Krueger, 1995). The described mechanism of coping with stress and difficult situations becomes a model followed by children brought up in this type of family. The characteristic feature of patients with anorexia may thus be suppressing aggressive behavior in response to parental attitudes, which takes place particularly in the mother-daughter dyad. Difficulty in expressing anger and directing aggression onto external objects leads to auto-aggression, i.e. directing aggression onto oneself (Williams et al., 1990). However, given a family system functioning in such a way, this is the only form of expressing negative emotions or a sense of the ability to control one's own life. In this sense the lack of relation, or a very slight relation, between parental attitudes and aggressive behavior among daughters revealed in the present study may be disturbing. These girls have no possibility or adult consent to reveal their anger and dissatisfaction in an open way with how they are treated or how

their family is functioning. Thus they accumulate internally directed aggression, any outside form of which causes guilt and strengthens their critical attitude towards themselves (Goodsitt, 1985). In consequence, an eating disorder becomes a form of protest against outside control, the attitude of excessive demands and restraining autonomy on the part of the parent, which was indicated in earlier reports (Schmidt et al., 1993).

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Address for correspondence:

Prof. Teresa Rostowska
Instytut Psychologii, Uniwersytet Gdański
ul. Pomorska 68, 80-343 Gdańsk
t.rost@wp.pl