

Modifying Type A in a Nonclinical Population of Polish Managers

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Type A is widely treated as a risk of diseases (mostly coronary heart diseases) and stress, including occupational stress. The purpose of the study was to evaluate the efficiency of intervention in modifying Type A in 25 managers in comparison with 38 Type A controls, who did not participate in the intervention. Additionally, the usefulness of the intervention was analysed when reactivity, as a temperamental dimension of Type A participants, was taken into account. High reactivity of Type A persons was assumed here as the presumed cause of the negative consequences in their health and well-being.

The results showed a significant reduction in stress-related emotional symptoms, like depression, anxiety, anger, self-esteem, positive affects due to the intervention. These changes with the reduction in work ambiguity were greater in high reactive Type As than in low reactive ones.

Type A reactivity occupational stress well-being perceived role stress

1. INTRODUCTION

Explaining the relationship between personality, stress, and health has always been the target of psychological research.

Type A personality is widely considered to be related with stress and poor health, especially as a coronary heart disease (CHD) risk factor (Cooper et al., 1981). Although some findings do not confirm the relationship between Type A and coronary heart diseases (Matthews & Hanes, 1986), interest in

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Type A has not waned. Efforts are now focused on the quest for its toxic core and on the possibilities for intervention (Shaw & Dimsdale, 2000).

Intervention aimed at modifying Type A is widely considered as a stress and disease prevention, especially as far as occupational stress is considered (Ivancevich, Matteson, Freedman, & Philips, 1990; Quick, Quick, Nelson, & Hurrell, 1997). Through its chronic struggle for achievement, Type A is usually characteristic of ambitious, success-oriented workers (Ivancevich & Matteson, 1988).

2. THE RELATIONSHIP BETWEEN TYPE A, STRESS, AND DISEASES

Much of the research that has investigated the relationship between personality and CHD has concerned Type A described as an action-emotion complex including aggressiveness, hostility, competitive struggle for achievements, impatience, and time urgency (Rosenman, Swan, & Carmelli, 1988). The inconsistencies in epidemiological findings concerning global Type A and CHD (Matthews, 1988) caused an increased interest in single factors of Type A as possible risk factors. Some researchers point to hostility and anger (Dembroski, MacDougall, Williams, Haney, & Blumenthal, 1985; Diamond et al., 1992; Guyll & Contrada, 1998), others to time urgency/impatience (Edwards & Baglioni, 1991; Wright, 1988) or the competitive element of Type A (Boot-Kewley & Friedman, 1987) as real predictors of CHD and others diseases. The relationship between hostility and CHD, and its psychophysiological explanatory model has received most attention (Contrada, Krantz, & Hill, 1988). This model hypothesises that hostile Type A individuals experience anger more often and more intensely than nonhostile Type B (especially during more or less competitive tasks), and differ from Type B in cardiovascular and neuroendocrin reactivity (Diamond et al., 1992; Houston, 1988; Lyness, 1993). Frequent and more intense activation of the sympathetic-adrenomedullary system could be the presumed cause of the development of coronary diseases (Kamarck & Jennings, 1991).

The relationship between global Type A or hostility or anger as its component, and disease is seldom analysed from the stress perspective. Meanwhile, difficult emotions, which obviously include anger and hostility, are widely cited as stress symptoms (Quick et al., 1997; Strelau, 1997). Type A's stress-proneness is strongly supported by the results of studies on the relationship between Type A and occupational stress. Jamal (1985)

collected data from 218 white-collar workers. The results indicated that Type Bs had fewer psychosomatic complaints than Type As. Matteson, Ivancevich, and Smith (1984) examined the relationship of Type A with satisfaction and health complaints in 335 life insurance agents. Type As reported significantly more stress and expressed more health complaints than Type Bs. There was no difference in terms of work satisfaction between Type As and Type Bs. In a study by the same authors (Ivancevich, Matteson, & Smith, 1983) on 61 sales personnel, Type A reported significantly higher stress levels and ambitiousness, but not a significantly higher level of health problems. The results of some recent studies confirm previous evidence showing that Type As report more stress symptoms, such as irritation, somatic complaints, and anxiety than Type Bs (Cooper, Watts, Baglioni, & Kelly, 1988; Kushnir & Melamed, 1991; Sutherland & Cooper, 1991).

A study by Berg and Schalk (1997), which investigated the relationship between the Type A, work overload, role related stress, and well-being on 893 employees performing information work, showed that work overload did not moderate the relationship between the Type A and well-being. Berg and Schalk (1997) suggest that Type As should be trained to perceive their tasks in a more realistic fashion and to take time-out for relaxation during their work activities.

Cooper and Baglioni's (1988) analysis of the link between a person and occupational stress showed that a personality trait like Type A precedes and determines the perception of job stresses, which also affects the mental well-being of these persons. Type As perceive more job stressors and their tasks more demanding than Type Bs. The authors suggest that "the Type A persons may be more sensitive to stressors actually present in their work environment or that by their competitive, rapid-paced approach to activities are creating stressors in their environment" (p. 100).

Similarly, Elias (1997) points to overstimulation of some Type A persons as a possible source of stress these persons experience. These Type A persons are additionally characterised by high reactivity. High reactivity as a temperamental dimension (Elias, 1981; Strelau, 1998) is incoherent with Type A because it induces persons to participate in strongly stimulating situations. According to Elias there are two kinds of Type A: coherent with low reactivity and high need of stimulation (nonpathological) and incoherent with high reactivity and low need for stimulation (pathological Type A; Elias & Wrześniewski, 1991).

The evidence shows that reactivity plays a decisive role both in the origin of Type A (Elias & Wrześniewski, 1988, 1991) and in the process

of differentiating its negative health consequences. High reactive (pathological) Type A persons experience more stress symptoms like ill-health symptoms and a higher level of anxiety than low reactive (nonpathological) Type As, and probably relate to a widely described in the literature Type A (Eliasz & Cofta, 1992). Eliasz hypothesises that overstimulation of pathological Type As can be caused by their anxiety (Strelau, 1985) and can be related to cognitive oversensitivity (Eysenck, 1993, as cited in Eliasz, 1997) or cognitive interferences (Sarason, 1999). This hypothesis is very much in line with Cooper's conclusion that Type As are more sensitive to stressors than Type Bs.

3. TYPE A MODIFICATION PROGRAMS

Attempts at modifying Type A in healthy participants or in cardiovascular patients followed almost immediately the first studies showing correlation between Type A diagnosed by a Structured Interview and its other paper-and-pencil measures, and CHD¹. Unfortunately, there are only few studies with control groups or experimental groups of more than 10 participants (Suinn, 1980).

Suinn and Bloom (1978) established Anxiety Management Training (AMT) for healthy males and females lasting for 6 weekly sessions. The treated participants showed significantly lower scores on the hard driving/competitive and speed/impatience factors of the Jenkins Activity Scale. The AMT interventions were successfully used in several other studies (Suinn, 1980).

Roskies, Spevak, Surkis, Cohen, and Gilman (1978) compared a stress-management program similar to AMT and psychotherapy (14 weekly sessions) aimed at problems stemming from childhood in males and females with CHD. Both kinds of interventions led to a significant reduction in perceived time urgency and pressure, but the stress management group maintained their improvement better than the psychotherapy group (Roskies et al., 1986). Levenkron, Cohen, Mueller, and Fisher (1983) confirmed in their study that behavioural therapy for 38 healthy men, lasting for 8 weekly sessions, turned out to be more effective than group support or brief suggestions for habit changes offered to the participants by a cardiologist and psychologist.

The largest project was conducted by Friedman et al. (1986) on 1,013 postmyocardial patients observed for 4.5 years to determine whether their

¹ Existing interventions of Type A have been described elsewhere (Żołnierczyk-Zreda, 2000).

Type A behaviour could be altered. The participants obtained 33 sessions (90 min each) of behavioural-cognitive counselling including progressive relaxation, behaviour alteration techniques, changes in certain beliefs, restructuring of various environmental situations, and cognitive-affective learning. The intervention led to significant changes in Type A, especially in hostility and time urgency diagnosed by both the Videotaped Structured Interview and a self-report questionnaire, and to significant reductions in cardiac recurrence and cardiac deaths. However, the authors suggested that the change in Type A could be even greater if some cognitive beliefs and attitudes about oneself, others, and life in general had been emphasised during the therapy (Powell, Friedman, Thorensen, Gill, & Ulmer, 1984).

Bennett, Wallace, Carroll, and Smith (1991) proved that their 8 weekly session interventions focused on reducing anger and hostility were also efficient in lowering blood pressure, modifying Type A (both JAS scores and Structured Interview ratings), reducing anger-in control (measured with Spielberger's Anger Expression Scale).

The so-far presented results of self-report measures suggest that Type A benefits from different kinds of interventions but it is almost impossible to choose one method that is superior. Even a brief psychological intervention can promote changes in Type A (Bennett et al., 1991). Some evidence shows a trend of behavior therapy being more promising than psychotherapy on follow-up (Roskies, Spevak, Surkis, Cohen, & Gilman, 1979). Reduction of state anxiety was routinely found for stress management through the use of relaxation techniques (Suinn, 1980). Some authors also point to the importance of cognitive techniques in modifying Type A (Powell et al., 1984).

Most programs, apart from cardiovascular functioning, studied changes in the components of Type A, mainly hostility and time urgency, anger, or depression as an effect of interventions. However, none of the mentioned studies explored the perception of stress resulting from the program.

4. THE PRESENT STUDY

4.1. The Intervention Programme

The aim of the intervention was to teach participants how to adjust their philosophy and behavioral habits to their temperamental potentialities. The

intervention was based on cognitive-emotive and behavioral techniques, described in detail elsewhere (Żołnierczyk-Zreda, 2000). The cognitive methods were focused on developing self-awareness concerning one's own cognitive schemata, mostly concerning self-esteem and underlying driven behavior (Price, 1988), some destructive habits like overloading, engaging in competition, and temperamental potentialities.

Sessions started and finished with some behavioral techniques based on concentration and meditation exercises. They were introduced to teach participants how to overcome the feelings of time urgency, impatience, and anger proneness, but also how to become sensitive to one's body, how to recognise the signs of tiredness or exhaustion.

Other techniques like assertiveness training, role playing in different work situations were used to practice how to realise one's needs without being aggressive or submissive. Time management and techniques of establishing priorities were aimed at teaching ways to schedule properly, organise work, to avoid rushing and being overwhelmed by details.

One of the most important tasks of the training was to provide the participants with a great amount of emotional support both from trainers and colleagues.

The intervention involved 10 four-hour weekly sessions including one 2-day weekend session lasting 8 hrs each day. Nine participants dropped out of our 4-month programme because of their absence in more than one session or because of schedule conflicts leaving 28 who began treatment.

The study had two primary objectives. The first one was to determine if the intervention was effective in four categories of variables:

1. intensity of Type A;
2. emotional stress symptoms (anxiety, anger and curiosity as a state or a trait, depression, self-esteem, positive and negative affects);
3. somatic complaints;
4. perceived occupational role stress (perceived role overload, role conflict, role ambiguity).

The control group consisted of participants from the same population but not exposed to the intervention.

The second objective of the study was to compare the effectiveness of the intervention when another individual variable, reactivity (high or low) of the participants, was taken into account.

4.2. Hypotheses

We hypothesised that our intervention would be effective in reducing Type A intensity, emotional stress symptoms, somatic complaints, and occupational role stress.

Our second hypothesis was that because high reactive Type As (pathological Type As) would behave against their temperamental capacities, they could benefit more from the intervention than the low reactive Type As (nonpathological Type As). The main target of the intervention in our study was to teach the participants to improve their coping capacities in order to better adjust their behaviors and beliefs to their temperamental potentialities. Type A—incoherent with its high reactivity—should find the proposed intervention more “curing,” than low reactive—coherent with Type A—persons.

4.3. Variables

4.3.1. Reactivity

Reactivity was measured with the Strelau Temperament Inventory—Revised (Strelau, Angleitner, Bantelmann, & Ruch, 1990), now called the Pavlovian Temperament Scale. This is a 57-item multidimensional self-report inventory designed to measure three basic properties of nervous processes. Reactivity scale consists of 19 items. Participants answered questions choosing one of the 4 options (from *I thoroughly agree* to *I definitely disagree*). In our study Cronbach’s alpha index of reliability for the scale measuring reactivity was .86.

4.3.2. Type A intensity

Type A was measured using Wrześniewski’s (1990) questionnaire based on the Jenkins Activity Scale. The scale includes 22 questions relating to the following factors: the need for achievement (5 questions), tendency to dominate (3 questions), aggressiveness (4 questions), speed (5 questions), and impatience (5 questions). The intensity of Type A was estimated on a 5-point scale.

In Wrześniewski’s (1990) study the reliability Cronbach’s alfa index was .96 for women and .98 for men. In our study Cronbach’s alpha index of reliability was .79 for all participants.

4.3.3. *Emotional stress symptoms*

4.3.3.1. Anxiety, curiosity, anger as a state and trait. The Polish adaptation (Wrześniewski, 1991) of Spielberger's State-Trait Personality Inventory (STAI) was used to measure the emotional aspect of psychological well-being. The method consists of three independent scales: Anxiety, anger, and curiosity are measured both as personality traits and as emotional states. There is a set of 10 questions for each scale, ranging from 1 (*not at all*) to 4 (*almost always*).

In our study Cronbach's alpha coefficients were .91, .80, .93 for, respectively, anxiety, curiosity, and anger as a state and .85, .84, and .88 for anxiety, curiosity, and anger as a trait.

4.3.3.2. Depression. The level of depression was measured with Beck's Depression Inventory (BDI) translated by Lewicka and Czapiński (Czapiński, 1994). The scale consists of 21 statements describing different symptoms of depression. The participants chose one of three statements valued from 0 to 3. In the present study Cronbach's alpha coefficient was .86

4.3.3.3. Positive and negative affects. The Polish version of the Bradburn's questionnaire translated by Lewicka and Czapiński (Czapiński, 1994) was used to measure two independent dimensions: negative and positive affects. The questionnaire consists of 10 items: 5 for each scale. Participants answered *yes* or *no*.

The index of internal consistency calculated in Czapiński's (1994) study was .62 for the positive affect and .58 for the negative one. In our study the relative indices were .58 and .62, respectively.

4.3.3.4. Self-esteem. The scale was prepared by Czapiński (1994) and its 6 items came from Rosenberg's scale, which consists of 16 items relating to different aspects of life. The answers are given on a 2-point scale: *yes* or *no*. The reliability index for this scale was .79.

4.3.4. *Somatic complaints*

4.3.4.1. Intensity and frequency of somatic symptoms. Widerszal-Bazyl's (Widerszal-Bazyl, Cieślak, & Najmiec, 1995) method for describing 30 frequently encountered somatic complaints was used. The intensity and frequency of the complaints was estimated on a 6-point scale.

In Widerszal-Bazyl et al.'s (1995) study Cronbach's alpha index of reliability was .87 for intensity assessment and .84 for frequency. In this study the indices were .89 for intensity and .88 for the frequency of somatic complaints.

4.3.5. Stressors connected with occupational role

Borucki's (1988) Scale of Organisational Stress was used. The scale consists of 36 items: 12 items for the subscale of role conflict, 12 for the subscale of role ambiguity, and 12 for role overload. These three role stressors were estimated on a 5-point scale.

In Borucki's study the reliability indices (Cronbach's alpha) were .74 for role conflict, .81 for role ambiguity, and .86 for role overload. In the present study it was, respectively, .91, .89, .84.

4.4. Procedure

4.4.1. Pre-treatment procedure

There were 257 low- and top-level managers from different companies in the service sector (banks, insurance companies, advertisement agencies) who volunteered to participate in a program called "Occupational Stress Management Training." A group of 123 persons with at least 2-year experience at their posts and older than 23 was selected.

4.4.2. Design of the evaluation of intervention effectiveness

The 8 questionnaires described in section 4.3. were administered to all participants.

Seventy-eight participants were found to be Type A on the basis of the median (77) of the Type A scale scores. They included 42 Type As who scored below the median (47) in the reactivity questionnaire (PTS) and constituted the high reactive (pathological) Type A group, and 36 who scored above the median value, and were the low reactive (nonpathological) Type A. All of them were randomly allocated to one of two conditions: stress management training and a delayed intervention (the control condition).

4.4.3. Sample

Sixty-three participants took part in the study. They were low- and top-level managers, they worked in Warsaw, Poland, in banks, insurance companies, advertisement agencies, and other organisations of different sizes and of different forms of ownership. They were between 28 and 56 years old. The average age was 33.75, and 75% of the group were younger than 40.

Women constituted 68% and men 32% of the sample. More than half of

them had no children (56%). The majority of the participants had higher education (95%). The average number of years they had worked at their current post was 4.06.

4.4.4. Post-treatment assessment

One month after the intervention both groups, experimental and control, completed exactly the same questionnaires as at the beginning. Three participants did not return the questionnaires, so finally the study sample consisted of 63 Type A participants. It included 32 high reactive (pathological) Type As, and 31 low reactive (nonpathological) Type As.

In order to check the stability of the effects of the intervention the experimental group is going to have follow-up measures taken 1 year after the end of the intervention.

Type B participants also received intervention, but data relating to them are not reported here.

4.5. Method of Analysing Statistically Changes in Scores of 8 Dependent Variables

In order to answer the question of whether participation in the program influenced changes in scores of emotional and somatic stress symptoms, and perceived occupational role stress in high and low reactive Type As, an analysis of variance (ANOVA) General Linear Model Univariate Analysis Type III (unbalanced) was conducted with an SPSS for Windows package (SPSS, 1999). The changes in scores were computed by subtracting pretest from post-test scores. The independent variables were intervention (I), reactivity (R), and the intervention \times reactivity (I \times R) interaction. Based on the median values two levels for each of these variables were determined (2 \times 2).

In order to answer the question whether intervention was more effective for the high reactive or the low reactive Type As who participated in the study, post hoc analyses were undertaken using the LSD test in those cases where the intervention \times reactivity interaction turned out to be significant.

5. RESULTS

Table 1 presents descriptive statistics with a test for the difference between the pre- and the post-test for all dependent variables in the intervention and nonintervention groups.

TABLE 1. Means and Standard Deviations in Intervention and Nonintervention Groups

Variables	Scale	Nonintervention Group (N = 38)						Intervention Group (N = 25)					
		Measurement 1			Measurement 2			Measurement 1			Measurement 2		
		M	SD	t	M	SD	t	M	SD	t	M	SD	t
Type A	22-110	83.50	6.77	83.87	6.69	-2.67*	83.92	6.85	79.92	9.70	2.41*		
Trait-anxiety	10-40	19.18	6.97	19.03	6.96	1.36	19.48	6.16	17.56	4.69	1.86+		
Trait-curiosity	10-40	32.05	4.86	31.29	5.43	2.26*	29.88	5.20	29.80	5.04	0.09		
Trait-anger	10-40	15.03	7.05	14.89	6.98	1.15	15.16	6.44	11.72	2.61	3.27**		
State-anxiety	10-40	24.05	6.01	24.05	6.01	a	23.68	6.30	22.16	6.07	2.18*		
State-curiosity	10-40	32.68	4.54	32.74	4.67	-0.70	32.00	5.20	31.92	5.11	0.123		
State-anger	10-40	24.97	5.89	24.95	5.90	1.00	23.16	5.79	21.76	6.46	1.88+		
Role conflict	12-110	30.32	9.71	33.08	16.92	-1.04	33.32	10.61	32.24	11.09	0.84		
Role ambiguity	12-110	33.13	10.08	33.29	10.30	-1.43	35.16	10.28	33.68	11.51	1.03		
Role overload	12-110	32.55	7.55	32.79	7.64	-2.04*	33.96	8.82	35.36	8.34	-1.18		
Depression	15-44	12.29	7.58	12.42	7.62	-2.37*	13.72	12.35	10.56	10.38	2.04+		
Positive affects	5-10	7.79	1.30	7.68	1.38	1.67	7.36	1.38	8.08	1.26	-2.52*		
Negative affects	5-10	7.34	1.47	7.39	1.50	-1.00	7.52	1.47	6.68	1.49	2.72*		
Self-esteem	5-10	9.16	2.31	9.13	2.34	1.00	9.28	2.70	10.80	2.00	-3.10**		
Frequency of somatic symptoms	0-150	33.00	16.49	33.50	16.35	-1.84+	33.04	19.09	33.00	18.32	0.02		
Intensity of somatic symptoms	0-150	43.24	17.85	44.03	17.97	-3.43***	42.88	19.21	39.96	15.83	1.35		

Notes. a—t cannot be computed because the standard error of the difference is 0; +p < .1, *p < .05, **p < .01, ***p < .001. For the intervention group, Measurement 1 was a pre-intervention measurement, Measurement 2 was a post-intervention measurement.

5.1. Type A

In Type A intensity the only main effect of intervention turned out to be significant ($F(1, 59) = 10.04, p < .01$). There was a greater decrease in Type A intensity in the group participating in the intervention ($M = -3.98$) than in those Type As who did not participate in the intervention ($M = 0.37$). Type A intensity in the experimental group was lower after the treatment ($t(24) = 2.41, p < .05$). In the control group Type A intensity increased significantly in the follow-up measurement ($t(37) = -2.67$). This outcome can be treated as confirmation of the strong influence of the intervention on the decrease of Type A intensity in the study. Reactivity was not a significant source of variance in Type A intensity, nor the interaction of reactivity and intervention.

5.2. Emotional Stress Symptoms

5.2.1. Anger, anxiety, curiosity as a trait or as a state

For measures of the change in anger as a state, ANOVA revealed a highly significant intervention ($F(1, 59) = 16.71$) condition. A greater decrease in anger as a state was found in the experimental group ($M = -1.26$) than in the control group ($M = 0.37$). Also reactivity turned out to be a significant factor in changes in scores of anger as a state ($F(1, 59) = 4.12, p < .42$). High reactive Type As decreased in anger as a state more ($M = -0.92$) than low reactive Type As ($M = -0.37$).

The intervention \times reactivity interaction was also found to be significant for changes in the intensity of anger as a state ($F(2, 59) = 4.57, p < .037$). Post hoc LSD analysis revealed a significant decrease in anger as a state in high reactive Type As after the intervention ($M = -1.84, p < .000$) as compared to the group of low reactive Type As also after the intervention ($M = 0.00, p < .009$; Figure 1).

Even for measures of the change in anger as a trait, the intervention turned out to be a significant factor ($F(1, 59) = 4.72, p < .034$). In the experimental group the decrease in anger as a trait was greater ($M = -3.51$) than in the control group ($M = -0.13$). In the intervention group the level of anger as a trait (Table 1) dropped significantly after the intervention ($t(24) = 3.27, p < .01$). Neither the main reactivity effect ($p < .5$), nor the intervention \times reactivity interaction ($p < .2$) approached significance.

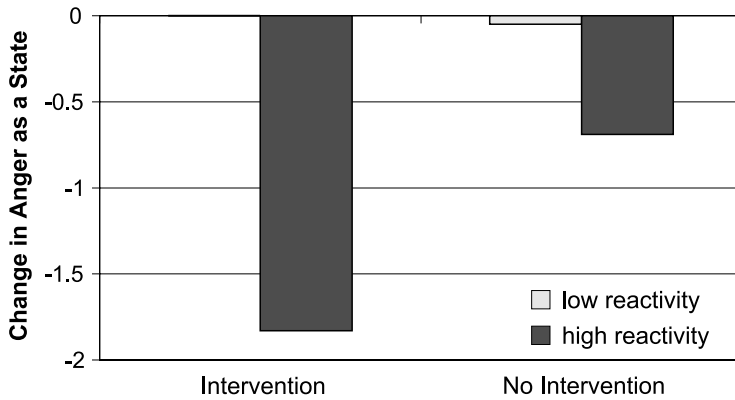


Figure 1. Changes in anger as a state depending on the intervention \times reactivity interaction.

For measures of the change in anxiety as a state, the only main reactivity effect turned out to be a significant factor ($F(1, 59) = 4.62, p < .036$). In the group of high reactive Type As there was a greater decrease in anxiety as a state ($M = -1.33$) than in the group of low reactive Type As ($M = -0.23$). Moreover, in the experimental group (Table 1) a significantly lower mean level of anxiety as a state ($t(24) = 2.18, p < .05$) was observed after the intervention. In the control group the mean level did not change at all.

For measures of changes in anxiety as a trait, all three factors, intervention ($F(1, 59) = 8.30$), reactivity ($F(1, 59) = 4.12$), and the interaction of intervention \times reactivity ($F(2, 59) = 4.12$) turned out to be significant. In the experimental (intervention) group the decrease in anxiety as a trait was greater ($M = -1.98$) than in the control (nonintervention) group ($M = -0.58$). Similarly, in the high reactive Type A the decrease in anxiety as a trait was greater ($M = -2.19$) than the low reactive Type A ($M = -0.38$). Post hoc LSD analysis revealed that the group of high reactive Type As declared significantly greater decrease in anxiety as a trait after the intervention ($M = -3.58, p < .01$) than did the low reactive Type As due to the intervention ($M = -0.79, p < .01$; Figure 2).

For measures of changes in curiosity both as a trait and as a state, ANOVA revealed none of the significant factors considered in the study, that is, intervention, reactivity, and the interaction of intervention and reactivity, to be significant. However, in the control group (Table 1) the level of curiosity as a trait decreased significantly in the follow-up measurement ($t(37) = 2.26, p < .05$). In the experimental group such a decrease was not observed. This could mean that the intervention had its preventive effects of decreasing curiosity.

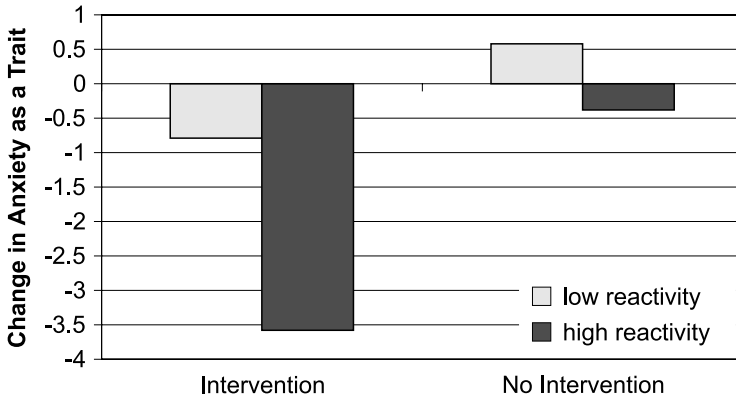


Figure 2. Changes in anxiety as a trait depending on the intervention \times reactivity interaction.

5.2.2. Depression

For measures of changes in depression ANOVA revealed a significant effect of intervention ($F(1, 59) = 8.65$), reactivity ($F(2,59) = 7.14$), and the interaction of intervention and reactivity ($F = 7.39$). In the experimental group a decrease in depression was observed ($M = -3.29$) in comparison with the control group where a slight increase was found ($M = 0.13$). The high reactive Type As reported a greater decrease in depression ($M = -3.13$) than did the low reactive Type As. Post hoc LSD analysis revealed that the group of high reactive Type As reported a significantly greater decrease in the level of depression after the intervention ($M = -6.42$) than did the low reactive Type As due to the intervention ($M = -1.5$, $p < .001$; Figure 3).

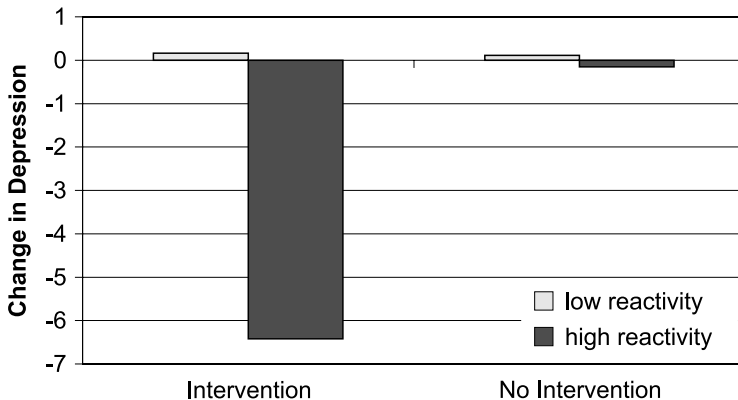


Figure 3. Changes in depression depending on the intervention \times reactivity interaction.

5.2.3. Self-esteem

For measures of changes in self-esteem, intervention ($F(1, 59) = 17.02$) and interaction of intervention and reactivity ($F(2, 59) = 4.47$) turned out to be significant factors. The experimental group declared an increase in self-esteem ($M = 1.55$), and the control group a slight decrease ($M = -0.03$). In the experimental group the level of self-esteem increased significantly (Table 1) after the intervention ($t(24) = -3.10, p < .001$).

Moreover, the main effect of reactivity approached significance ($F(1, 59) = 3.90, p < .53$). The high reactive Type As tended to gain a greater increase in the level of self-esteem ($M = 1.14$) as compared to the low reactive Type As ($M = 0.38$). Post hoc LSD analysis revealed that the group of high reactive Type As reported a significantly greater increase in self-esteem after the intervention ($M = 2.33, p < .000$) than did the group of low reactive Type As due to the intervention ($M = 0.77, p < .01$; Figure 4).

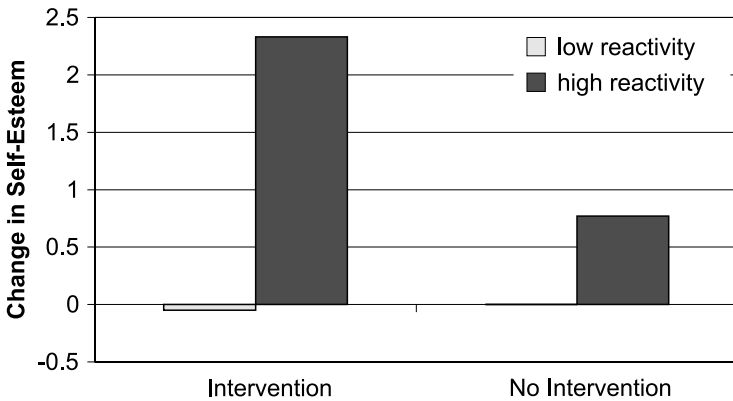


Figure 4. Changes in self-esteem depending on the intervention \times reactivity interaction.

5.2.4. Positive affects

For measures of changes in positive affects, only intervention turned out to be a significant factor ($F(1, 59) = 0.002$). In the experimental group a significant increase in positive affects (Table 1) was observed after the intervention ($t(24) = -2.52, p < .05$).

5.2.5. Negative affects

For measures of changes in negative affects, ANOVA revealed only reactivity to be a significant factor ($F(1, 59) = 4.58$). In the group of low reactive

Type As there was a decrease in negative affects ($M = -1.13$) in comparison with high reactive Type As ($M = 0.07$). In the experimental group the level of negative affects (Table 1) dropped significantly after the intervention ($t(24) = -2.52, p < .05$).

5.3. Somatic Complaints

5.3.1. Frequency of somatic symptoms

For measures of changes in the frequency of somatic symptoms, ANOVA did not reveal any significant factors. However, in the control (nonintervention) group (Table 1) there was a tendency for the frequency of somatic symptoms to increase ($t(37) = -1.84, p < .1$).

5.3.2. Intensity of somatic symptoms

An analysis of the intensity of somatic symptoms revealed a near-significant main effect of the intervention, ($F(1, 59) = 3.94, p < .052$) indicating a tendency for the intensity of somatic symptoms to decrease in the experimental ($M = -2.78$) as compared to the control group ($M = 0.79$). Moreover, in the control (nonintervention) group (Table 1) there was a significant increase in somatic symptoms between pre- and post-test measurements ($t(37) = -3.43, p < .000$). This can be an argument for the beneficial role of the intervention in preventing perceived intensity of somatic symptoms.

5.4. Occupational Role Stressors

Neither intervention, nor reactivity were found to be a significant factor in variance of any of the perceived role stress measures. However, the interaction of intervention and reactivity turned out to be significant for the measures of role ambiguity ($F(2, 59) = 4.25$). The post-test LSD analysis proved that the high reactive Type As declared their role ambiguity reduced significantly after the intervention ($M = -3.75, p < .01$) in comparison with the group of low reactive Type As due to the intervention ($M = 0.66, p < .01$; Figure 5).

The descriptive statistics of the control and experimental groups (Table 1) show a significant increase in the perceived role overload in the control

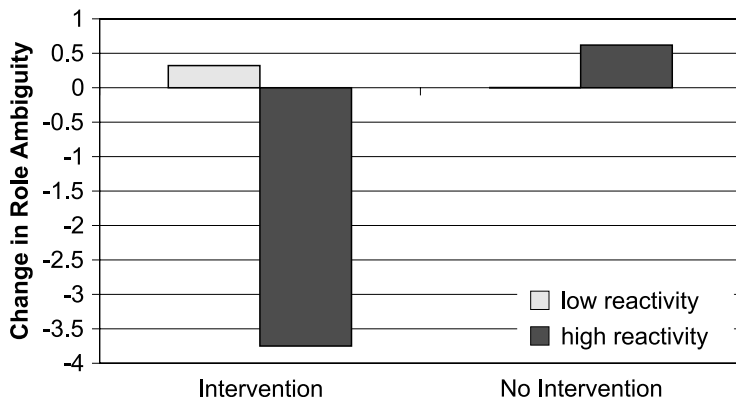


Figure 5. Changes in role ambiguity depending on the intervention \times reactivity interaction.

group ($t(37) = -2.04, p < .01$) between pre- and post-test measurements. In the experimental group there was no similar effect. It can be assumed that the intervention could prevent the occurrence of a similar effect of increase in perceived role ambiguity in the experimental group.

The answer to the first question of our study is that intervention turned out to have a significant influence on the changes in seven different indices of dependent variables among the sixteen considered in the study. Due to the intervention the following significant changes in Type A participants' self-reports were observed:

1. a decrease in Type A intensity,
2. a decrease in anger as a state,
3. a decrease in anger as a trait,
4. a decrease in anxiety as a trait,
5. a decrease in the level of depression,
6. an increase in positive affects,
7. an increase in self-esteem,
8. a strong tendency for the intensity of somatic symptoms to decrease.

As the results show the intervention turned out to be particularly effective for the variables considered as emotional stress symptoms.

A significant increase in the levels of Type A, curiosity as a state, depression, intensity of somatic symptoms, and role overload was observed in the group not participating in the intervention. Lack of similar results in the intervention (experimental) group might be assumed as an important preventive role of the intervention.

The second objective was to check if the intervention was more effective for high or low reactive Type A participants. Reactivity turned out to be a significant factor of variance for the measures of six variables. The high reactive Type A participants both involved and not involved in the intervention reported the following significant changes in variables:

1. a decrease in anxiety as a trait,
2. a decrease in anxiety as a state,
3. a decrease in anger as a state,
4. a decrease in the level of depression,
5. a strong tendency for self-esteem to increase.

Although the high reactive Type A participants declared a significant improvement in most of the well-being variables, in the case of negative affects the tendency was opposite. In the low reactive Type As there was a significant decrease in the negative affects.

Interaction of intervention and reactivity turned to be a significant factor in the changes of five indices. The high reactive Type A participants taking part in the intervention in comparison with the low reactive Type A participants also taking part in the intervention declared a significantly

1. greater decrease in anger as a state,
2. greater decrease in anxiety as a trait,
3. greater decrease in the level of depression,
4. greater increase in their self-esteem,
5. greater decrease in their role ambiguity.

The more beneficial role of intervention for the high reactive Type A participants than for the low reactive ones confirmed the aforementioned results. Moreover, it turned out that the high reactive Type As perceived their occupational role as less ambiguous after the intervention than the low reactive ones also participating in the intervention.

6. DISCUSSION

The present study is the first to report on the effectiveness of an intervention to a large extent based on existing programs targeted at modifying Type A but realised on a sample of young Type A managers working in equally young Polish capitalism. The assessment of the effectiveness of this intervention was based on self-report methods.

The results of our study show very clearly that the fact whether Type A managers had or had not been exposed to the intervention had the strongest influence on symptoms of decreased perceived stress.

Surprisingly great changes occurred due to the intervention in emotional stress symptoms, even in the perceived personality traits of anxiety and anger. This is especially exciting, considering that in the aforementioned studies that used State-Trait Anxiety Inventory (STAI), Roskies et al. (1978) and Levenkron et al. (1983) failed to find reductions in anxiety scores. Neither do our results confirm Suinn's (1980) conclusion that the greatest reductions in anxiety scores are observed in high-anxious participants. Despite not high pretest values of anxiety and anger (STPI) in our study, reductions in both anxiety and anger scores turned out to be significant.

Although it was not assumed that the 4-month intervention could significantly change the participants' health condition, the improvement of well-being in the experimental group was accompanied by perception of their own somatic symptoms as less bothersome (intense) after the intervention than before in the control (nonintervention) group. This could be the commonly known beneficial effect of psychotherapy (relaxation and cognitive methods) in treating pain (Sarafino, 1994).

In the group not exposed to the intervention there was a significant increase in the levels of Type A, curiosity as a state, depression, intensity of somatic symptoms, and role overload. Lack of similar results in the intervention (experimental) group points to the preventive role of the intervention as far as these variables are concerned. It can be assumed that decreasing Type A in managers can influence their perception of workload as an aspect of role stress.

The present study is also the first to report on the effectiveness of an intervention of Type A modification depending on reactivity as a dimension of temperament strongly connected with the need for stimulation. Reactivity understood in this way was found to be, alongside the intervention, a very significant factor of variance of measures of different stress symptoms. The high reactive Type A participants in the study (both the control and experimental groups) declared significant amelioration in their well-being in the 6 months since being invited to join the program. However, apart from the intervention some other uncontrolled factors could have influenced the final assessment of their well-being. This question concerns mostly those high reactive Type A participants who did not take part in the intervention. Was the mere fact of being invited to the study and promising to take part in the stress management intervention so influential for the well-being of the controls? Was

the effect of expected availability of support sometimes an even stronger predictor of well-being than enacted or realised support (Helgeson, 1993)? Although the results of our study show very clearly that the strongest effect of decreasing perceived stress in Type A participants had the fact of being or not being exposed to the intervention, reactivity influenced this effect too.

The hypothesis of the stronger effects of intervention on high reactive Type As than on low reactive Type As was also strongly supported. Due to the intervention high reactive Type As declared a significantly greater decrease in depression, anger as a state, anxiety as a trait, and greater self-esteem improvement than did low reactive Type As who also participated in the intervention. Elias (1995a, 1995c) found that high reactive Type As, being more concentrated on the motives of self-value than low reactive Type As, at the same time had these motives less satisfied. Participation in the intervention could have for high reactive Type As the effect of satisfying these motives to a larger extent than for low reactive Type As. Particularly spectacular is the effect of the change in the perception of anxiety as a personality trait in high reactive Type A due to intervention. Additionally, high reactive Type As declared finding their occupational role less ambiguous after the intervention. This was not the case for low reactive Type As. This also confirms Elias's hypothesis of the relationship between anxiety and cognitive oversensitivity in high reactive Type As. Reduced anxiety in this group accompanied a decrease in their role ambiguity due to intervention. It could also happen conversely: gaining more clarity about their occupational role due to the techniques of setting priorities, scheduling, time management, and so forth, their anxiety decreased, too.

Surprisingly, the great improvement in well-being of high reactive Type A participants due to the intervention was not accompanied by alleviation in their Type A intensity. That could be explained by the great rigidity of Type A in high reactive persons pointed to by Elias (1997), and difficulty in changing it in comparison with low reactive ones. A similar improvement in low reactive Type As was observed in the case of negative affectivity. Could the lack of improvement of negative affectivity in high reactive Type As be due to the same rigidity of this variable depending on reactivity?

Another possible explanation of this outcome is that the intervention influencing self-esteem and well-being of high reactive Type As encouraged them to also satisfy their task motives related to occupational success, conscientiousness, and aggressiveness understood by insecure persons as social assertiveness.

Summing up, presumably there could be two reasons for the very strong

effectiveness of the intervention used in our study. First, it was targeted at teaching participants to adjust their cognitive schemata and behaviors to their own possibilities (also temperamental), and to commonly accepted but seldom realised values. These values like respecting oneself and others, being close to nature, caring for one's health, and valuable relationships with close ones were promoted in our intervention. Second, the intervention turned out to be most effective for high reactive Type As. Their cognitive and social oversensitivity (Eliasz, 1995b) including oversensitivity to occupational stressors, makes them sensitive to social influence—both to social pressure and, as the results show, to an intervention being a sort of social support. That could undoubtedly be a strong argument for targeting preventive occupational stress management programs at high reactive Type A workers.

REFERENCES

- Bennett, P., Wallace, L., Carroll, D., & Smith, N. (1991). Treating Type A behaviours and mild hypertension in middle-aged men. *Journal of Psychosomatic Research*, *35*, 209–223.
- Berg, P.T. van den, & Schalk, R. (1997). Type A behavior, well-being, work-overload, and role related stress in information work. *Journal of Social Behavior and Personality*, *12*(1), 175–185.
- Boot-Kewley, S., & Friedman, H.S. (1987). Psychological predictors of heart disease: A quantitative review. *Psychological Bulletin*, *101*, 343–362.
- Borucki, Z. (1988). *Stres organizacyjny. Mechanizm—następstwa—modyfikatory* [Organisational stress. Mechanisms, results and modifiers] (Zeszyty Naukowe Uniwersytetu Gdańskiego). Gdańsk, Poland: Uniwersytet Gdański.
- Contrada, R.J., Krantz, D.S., & Hill, D.R. (1988). Type A behavior, emotion, and psychophysiology reactivity: Psychological and biological interactions. In B.K. Houston & C.R. Snyder (Eds.), *Type A behavior, theory, and intervention* (pp. 254–274). New York, NY, USA: Wiley.
- Cooper, G.L., & Baglioni, A.J. (1988). A structural model approach toward the development of a theory of the link between stress and mental health. *British Journal of Medical Psychology*, *61*, 87–102.
- Cooper, G., Detre, T., Weiss, S.M., Bristow, J.D., Carleton, R., Dustan, H.P. Elliot, R.S., Feinleib, M., Jesse, M.J., Klocke, F.J., Schwartz, G.E., Shields, J.L., & Stallones, R.A. (1981). Coronary prone behaviour and coronary heart disease: A critical review. *Circulation*, *63*, 1199–1215.
- Cooper, G.L., Watts, J., Baglioni, A.J., & Kelly, M. (1988). Occupational stress among general practice dentists. *Journal of Occupational Psychology*, *61*, 163–174.
- Czapiński, J. (1994). *Psychologia szczęścia* [Psychology of happiness]. Warsaw, Poland: Pracownia testów psychologicznych PTP.
- Dembroski, T.M., MacDougall, J.M., Williams, R.B., Haney, T.L., & Blumenthal, J.A.

- (1985). Components of Type A, hostility, and anger-in: Relationship to angiographic findings. *Psychosomatic Medicine*, 47, 219–233.
- Diamond, E.L., Schneiderman, D., Schwartz, J.C., Smith, R., Vorp, R.D., & Pasin, R.D. (1992). Harassment, hostility and Type A as determinants of cardiovascular reactivity during competition. *Journal of Behavioral Medicine*, 7, 171–189.
- Edwards, J.R., & Baglioni, A.J. (1991). Relationship between Type A behavior pattern and mental and physical symptoms: A comparison of global and component measures. *Journal of Applied Psychology*, 76(2), 276–290.
- Eliasz, A. (1981). *Temperament a system regulacji stymulacji* [Temperament and the system of stimulation control]. Warsaw, Poland: PWN.
- Eliasz, A. (1995a). Characteristic structure of motivation in Type A persons. *Polish Psychological Bulletin*, 26(4), 297–317.
- Eliasz, A. (1995b). Podmiotowe i środowiskowe czynniki utrudniające efektywną regulację stymulacji. [Internal and external obstacles in effective stimulation control]. *Czasopismo Psychologiczne*, 1(3), 129–141.
- Eliasz, A. (1995c). *Temperament, wartości i zdolności osób o Wzorze A* [Temperament and values, and abilities of Type A persons] (Kolokwia Psychologiczne, 5). Warsaw, Poland: Instytut Psychologii PAN.
- Eliasz, A. (1997). Obciążenie osób ze Wzorem A i B w zależności od ich reaktywności [Load of Type A and Type B persons depending on their reactivity]. *Studia Psychologiczne*, XXXV, 34–63.
- Eliasz, A., & Cofta, L. (1992). Temperament a skłonność do chorób [Temperament and proneness to disease]. In J. Strelau, W. Ciarkowska, & E. Necka (Eds.) *Różnice indywidualne. Możliwości i preferencje* (pp. 65–80). Wrocław, Poland: Ossolineum.
- Eliasz, A., & Wrześniewski, K. (1988). Type A behavior pattern resulting from internal and external reinforcements. *Polish Psychological Bulletin*, 17, 39–53.
- Eliasz, A., & Wrześniewski, K. (1991). Two kinds of Type A behavior pattern. In C.D. Spielberger, I.G. Sarason, J. Strelau, & J. Brebner (Eds.), *Stress and anxiety* (Vol. 13, pp. 275–282). New York, NY, USA: Hemisphere Publishing.
- Friedman, M., Thorensen, C.E., Gill, J.J., Ulmer, D., Powell, L., Price, V., Brown, B., Thompson, L., Rabin, D., Breal, W.S., Bourg, E., Levy, R., & Dixon, T. (1986). Alteration of type A behavior and its effects on cardiac recurrences in postmyocardial infarction patients. Summary results of the Recurrent Coronary Prevention Project. *American Heart Journal*, 112(2), 653–665.
- Guyll, M., & Contrada, R.J. (1998). Trait hostility and ambulatory cardiovascular activity: Response to social interaction. *Health Psychology*, 17(1), 30–39.
- Helgeson, V.S. (1993). Two important distinctions in social support: Kind of support and perceived versus received. *Journal of Applied and Social Psychology*, 23, 825–845.
- Houston, B.K. (1988). Cardiovascular and neuroendocrin reactivity, global Type A, and components of Type A behavior. In B.K. Houston & C.R. Snyder (Eds.), *Type A behavior, theory, and intervention* (pp. 212–253). New York, NY, USA: Wiley.
- Ivancevich, J.M., & Matteson, M.T. (1988). Type A behavior and the healthy individual. *British Journal of Medical Psychology*, 61, 37–56.
- Ivancevich, J.M., Matteson, M.T., Freedman, S.M., & Phillips, J.S. (1990). Worksite stress management interventions. *American Psychologist*, 45(2), 252–261.

- Ivancevich, J.M., Matteson, M.T., & Smith, S.V. (1983). *Technical report for blue company on sales personnel and Type A behavior pattern*. Houston, TX, USA: University of Houston.
- Jamal (1985). Type A behavior and job performance: Some suggestive findings. *Journal of Human Stress, 11*, 60–68.
- Kamarck, T., & Jennings, J.R. (1991). Biobehavioral factors in sudden cardiac death. *Psychological Bulletin, 109*, 42–75.
- Kushnir, T., & Melamed, S. (1991). Work-load, perceived control and psychological distress in Type A/B industrial workers. *Journal of Organisational Behavior, 12*, 155–168.
- Levenkron, J.C., Cohen, J.D., Mueller, H.S., & Fisher, E.B. (1983). Modifying the Type A coronary prone behavior pattern. *Journal of Consulting & Clinical Psychology, 51*, 192–204.
- Lyness, S.A. (1993). Predictors of differences between Type A and B individuals in heart rate and blood pressure reactivity. *Psychological Bulletin, 114*, 266–295.
- Matteson, M.T., Ivancevich, J.M., & Smith, S.V. (1984). Relation of Type A behavior to performance and satisfaction among sales personnel. *Journal of Vocational Behavior, 25*, 203–214.
- Matthews, K.A. (1988). Coronary heart disease and Type A behaviors: Update on an alternative to the Boot-Kewley and Friedman (1987) quantitative review. *Psychological Bulletin, 104*, 373–380.
- Matthews, K.A., & Haynes, S.G. (1986). Type A behavior pattern and coronary disease risk: Update and critical evaluation. *American Journal of Epidemiology, 123*, 923–60.
- Powell, L.H., Friedman, M., Thorensen, C.E., Gill, J.J., & Ulmer, D.K. (1984). Can the Type A behavior pattern be altered after myocardial infarction? A second year report from the Recurrent Coronary Prevention Project. *Psychosomatic Medicine, 46*(4), 293–313.
- Price, V. (1988). Research and clinical issues in treating Type A behavior. In B.K. Houston & C.R. Snyder (Eds.), *Type A behavior pattern, research, theory, and intervention* (pp. 275–311). New York, NY, USA: Wiley.
- Rosenman, R.H., Swan, G.E., & Carmelli, D. (1988). Definition, assessment, and evolution of the Type A behavior pattern. In K. Houston, C.R. Snyder (Eds.), *Type A behavior pattern, research, theory, and intervention* (pp. 8–31). New York, NY, USA: Wiley.
- Roskies, E., Seraganian, P., Oseasohn, R., Hanley, J.A., Collu, R., Martin, N., & Smilga, C. (1986). The Montreal Type A intervention project: Major findings. *Health Psychology, 5*, 45–69.
- Roskies, E., Spevak, M., Surkis, A., Cohen, C., & Gilman, S. (1978). Changing the coronary-prone (Type A) behavior pattern in a non-clinical population. *Journal of Behavioral Medicine, 1*, 201–216.
- Roskies, E., Spevak, M., Surkis, A., Cohen, C., & Gilman, S. (1979). Generalizability and durability of treatment effects in an intervention program for coronary-prone (Type A) managers. *Journal of Behavioral Medicine, 2*, 195–208.
- Quick, J.C., Quick, J.D., Nelson, D.L., & Hurrell, J.J. (1997). *Preventive stress management in organisations*. Washington, DC, USA: American Psychological Association.
- Sarafino, E.P. (1994). *Health psychology. Biopsychosocial interactions*. New York, NY, USA: Wiley.
- Sarason, I. (1999, July). *Stress, cognitive interference, and memory*. Paper presented at the 20th International Conference of the Stress and Anxiety Research Society, Cracow, Poland.

- Shaw, W.S., & Dimsdale, J.E. (2000). Type A personality, Type B personality. In G. Fink (Ed.), *Encyclopedia of Stress* (Vol. 3, pp. 624–629). San Diego, CA, USA: Academic Press.
- SPSS. (1999). *SPSS base v. 10.0. User's guide*. Chicago, IL, USA: Author.
- Strelau, J. (1985). *Temperament—osobowość—działanie* [Temperament—personality—activity]. Warsaw, Poland: PWN.
- Strelau, J. (1997). Temperament a stres: Temperament jako czynnik moderujący stresory, stan i skutki stresu oraz radzenie sobie ze stresem [Temperament and stress: temperament as a moderating factor, the state, and effects of stress, and stress management]. In I. Heszen-Niejodek & Z. Ratajczak (Eds.), *Człowiek w sytuacji stresu* (pp. 88–130). Katowice, Poland: Uniwersytet Śląski.
- Strelau, J. (1998). *Temperament—personality—activity*. London, UK: Academic Press.
- Strelau, J., Angleitner, A., Bantelmann, J., & Ruch, W. (1990). The Strelau Temperament Inventory—Revised (STI-R): Theoretical considerations and scale development. *European Journal of Personality*, 4, 209–235.
- Suinn, R.M. (1980). Intervention with Type A behaviors. *Journal of Consulting and Clinical Psychology*, 50(6), 933–949.
- Suinn, R., & Bloom, L. (1978). Anxiety management for Pattern A behavior. *Journal of Behavioral Medicine*, 1, 25–35.
- Sutherland, V.J., & Cooper, C.L. (1991). Personality, stress and accident involvement in the offshore oil and gas industry. *Personality and Individual Differences*, 12, 195–204.
- Widerszal-Bazył, M., Cieślak, R., & Najmiec, A. (1995). *Psychospołeczne właściwości pracy zawodowej, zmienne osobnicze a stres psychologiczny i dolegliwości zdrowotne; etap IV—Sumaryczne opracowanie wyników* [Psychosocial factors of work, individual variables and psychological stress and health ailments; Stage 4—A summary of the results]. Unpublished report No. III.019, Central Institute for Labour Protection, Warsaw, Poland.
- Wright, L. (1988). The Type A behavior pattern and coronary artery disease: Quest for the active ingredients and the elusive mechanism. *American Psychologist*, 43, 2–14.
- Wrześniewski, K. (1990). *Badanie Wzoru A przy użyciu polskiego kwestionariusza* [Polish questionnaire for the assessment of Type A behavior pattern]. Warsaw, Poland: Państwowy Zakład Wydawnictw Lekarskich.
- Wrześniewski, K. (1991). Trójczynnikiowy inwentarz stanów i cech osobowości [State and trait personality inventory]. *Przegląd Lekarski*, 48(2), 222–225.
- Żołnierczyk-Zreda, D. (2000). Modification of pathological Type A as worksite stress management and disease prevention intervention. *International Journal of Occupational Safety and Ergonomics*, 6(2), 169–188.