Final Report
on realization of research project

„The relationship between goal orientation and attitudes toward doping in sport. Knowledge about and attitudes toward doping among Polish athletes”

This project has been carried out with the support of the World Anti-Doping Agency

Aims of the Project:

The aims of the project were:

1/ to diagnose attitudes of athletes toward doping and determine if they are influenced by athlete's age, sex, and kinds of sports discipline practised (individual vs. team sports)

2/ to examine the relationship between goal orientations and attitudes toward doping

3/ to diagnose knowledge about doping among Polish athletes

Schedule of realization of the Project:

After having received the signed agreement the Project was realized in four phases:

1/ February/March 2006 – working out of questionnaires, recruiting a fan inquirer collecting questionnaire data from athletes and training her in research purposes, method of collecting the data etc., printing of questionnaires

2/ March/May 2006 – distribution of questionnaires among athletes

One thousand of questionnaires were distributed, 830 were received back or filled in. Response rate was 83%. Respondents were entirely Caucasians, 567 (68.31%) of them males, 263 (31.69%) females. Athletes were recruited from "schools of sports championship", athletes practising in the Academical Sports Union in Katowice and in sports clubs located in the Silesia Province. The study sample consisted of athletes representing local level, national level as well international level; and representing wide range of sports: winter individual sports (biathlon, cross-country skiing, downhill skiing, ski jumping, snowboard, sledging) (n=65), sports games: ice hockey (n=43), soccer (n=264), handball (n=78), volleyball (n=67) and basketball (n=76), swimming (n=65), track and field (n=71), power sports (weightlifting, powerlifting) (n=35), martial arts (boxing, karate, judo, taekwondo) (n=11), archery (n=21), acrobatic gymnastics (n=3), water sports (canoeing, yachting, windsurfing) (n=9), cycling (n=6), fencing (n=3), touring dance (n=4), tennis (n=5). Generally 530 (63.86%) athletes were representatives of team sports, while remaining of individual sports.

Age of the respondents ranged from 14 to 40 (M 20.02 SD 3.96) with adolescents making up 32.65% of the respondents, young adults – 57.11%, and adults – 10.24% of the sample. 775 of the respondents provided information about the length of their competitive experience which varied from half a year to 29 years (M 7.82 SD 4.04).

3/ June/July 2006 – data entry (entering the information from questionnaires into the computer data bank – 830 questionnaires x 4 pages = 3320 pages), and their statistical handling.

4/ September/October 2006 – interpretation of the data, preparing the Final Report.

Calculation of costs:

The research team received 1,632.00 USD. The exchange rate at the day of receiving the funds on the bank account was 1 USD = 3.1293 PLN. Total sum of PLN received = 5,107.02 zł.

Table 2. Calculation of incurred and planned costs of research

No.	Item of calculation	Incurred costs	Planned costs
1	Printing questionnaires	44.73 USD	150 USD
2	Distributing questionnaires among study sample	367.41 USD	700 USD
3	Research assistant (data entry, statistical analyses)	1214.06 USD	650 USD
4	Indirect costs	325.24 USD	340 USD
5	Total	1 951.44 USD	

Description to the calculation of costs:

1/ Printing questionnaires – incurred costs were 140 PLN (44.73 USD) and were three times lower than planned due to negotiation with the printing house operating by the Academy of Physical Education at no extra mark-ups (at costs)

2/ Payment for Mrs Magdalena Polok, 3rd year student of the Academy of Physical Education in Katowice who was recruited as an inquirer – incurred costs were 1150 PLN (367.41 USD) gross and were lower than planned, because of lower costs of reaching athletes to research and smaller number of the sample.

3/ Payment for Mrs Longina Swiatkowska who is a specialist-mathematician at the Medical University of Silesia and was responsible for computerizing the obtained questionnaire-data (830 questionnaires x 4 pages = 3320 pages) and their statistical processing – incurred costs were 3800 PLN (1214.06 USD) gross and were higher than planned which were underestimated (more time was necessary for processing the data than estimated).

The results obtained in the research

Knowledge of the athletes about doping and anti-doping policy

Knowledge was measured by means of questionnaire consisting of 45 items rated on 3-point scale "true – false – don't know". Items were worded in such a way that for about half of them "true" option was the right answer and ""false" was the wrong answer, while for the other half "true" option was the wrong answer and "false" option was the right answer.

The questionnaire consisted of 45-items divided into three categories:

1/ Knowledge of rights and responsibilities of an athlete – 11-items applying to knowledge of what an athlete is responsible for in the question of anti-doping rules, for example: "An athlete has the right to refuse to undergo doping control", "An athlete is not allowed to be accompanied by other persons in doping control checkpoint", "If prohibited substance was found in athlete's sample A, the athlete has the right to be present at opening and analysing of sample B"

2/ Knowledge on general principles and procedures of anti-doping policy and institutions – 17-items applying to knowledge on procedures of testing, consequences of anti-doping rule violations, institutions involved in anti-doping policy etc., for example "Anti-doping controls may take place only during competitions", "An athlete who set the record but violated an anti-doping rule is disqualified but his score remains uncanceled", "If an athlete was tested positive for two prohibited substances, for which different sanctions are provided, the most severe will be imposed"

3/ Knowledge of doping substances and methods and their influence on athlete's body – 16-items measuring knowledge on what substances and methods are considered as doping, and how they influence athletes's body, including awareness of their side effects, for example "Anabolic-androgenic steroids may increase blood level of 'bad' cholesterol", "EPO is a substance used in power sports to increase muscle mass", "Gene manipulations are now considered as prohibited methods".

For each respondent percentages of correct, incorrect and "don't know" answers were calculated and subsequent analyses were carried out both for total score and for each subscale separately. Significance between categories of respondents (gender, age, years of sports career, branch of sports discipline practiced) was estimated by means of Chi-square test.

Knowledge - general

Considering general indicator of knowledge, respondents gave less than half correct answers (45.22%) which means that their knowledge on doping is far from satisfactory. The

highest percentage of correct responses was observed in "knowledge on rights and responsibilities" (50.75%), followed by "knowledge of doping substances and methods" (45.09%), while the lowest in "knowledge about general principles and procedures (41.77%). Difference between the three subscales of knowledge was significant ($\chi^2_{df=4}$=579.61 p=.000). The level of knowledge was significantly higher in male than in female athletes (males: 46.42% of correct and 30.40% of incorrect answers, females: 42.63% and 33.38%, respectively; $\chi^2_{df=2}$=50.70 p=.000); in representatives of team sports than in representatives of individual sports (team: 45.27% of correct and 30.57% of incorrect answers, individual: 45.12% and 32.72%, respectively; $\chi^2_{df=2}$=27.49 p=.000. However, comparison of percentages of correct answers of both groups by means the test of two structure showed non significant difference); in young adults than in adults and adolescents (young adults: 47.48% of correct and 29.43% of incorrect answers, adults: 43.12% and 37.21%, respectively, adolescents: 41.92% and 32.86%, respectively; $\chi^2_{df=4}$=32.78 p=.000); and athletes with longer years of sports career (those practising sport 5 years or longer gave over 46% correct answers and about 30% of incorrect while those practising sport less than 5 years about 41% of correct and nearly 36% of incorrect, $\chi^2_{df=4}$=126.66 p=.000).

Knowledge of rights and duties

The highest percentage of correct answers in this category of knowledge was observed in item "The athlete himself/herself is fully responsible for substances found in his/her body, including unintentionally taken prohibited substances and methods" (75.30), the lowest in item "Nobody can help the athlete in pouring his/her urine sample to containers sent to laboratory" (10.72). There were no differences in distribution in "correct"-"don't know"-"incorrect" answers between male and female respondents ($\chi^2_{df=2}$=2.62 p=.271) and between specified age groups ($\chi^2_{df=4}$=2.42 p=.298). Significant differences were yet observed between answers of representatives of team and individual sports (with higher percentage of correct answers in representatives of team sports; $\chi^2_{df=2}$=27.58 p=.000) and in athletes with longer sports career (51.86% in athletes practising sport 5-10 years, 51.32% over 10 years, and 45.59% in practising sport shorter than 5 years; $\chi^2_{df=4}$=45.50 p=.000).

Knowledge of prohibited substances and methods

The highest percentage of correct answers in this category of knowledge was observed in item "Taking steroids can lead to depression and mood disturbances" (72.62), the lowest in item "Creatine is a prohibited anabolic agent" (22.05). In distribution of answers significant differences were observed in gender (with highest percentage of correct answers in male respondents; $\chi^2_{df=2}$=52.46 p=.000), branch of sport (with highest percentage of correct answers

in representatives of individual sports; $\chi^2_{df=2}$=58.02 p=.000), young adults compared to adults and adolescents ($\chi^2_{df=4}$=24.87 p=.000) and in athletes with longer sports career (career 5-10 years: 46.60% of correct and 2.74% of incorrect answers, career over 10 years: 46.00% and 30.83%, respectively, career shorter than five years: 41.09% and 35.91%, respectively; $\chi^2_{df=4}$=64.37 p=.000).

Knowledge of general procedures of anti-doping policy

The highest percentage of correct answers in this category of knowledge was observed in item: "List of banned substances may involve agents that can be found in supplements and medicines available without prescription" (84.34), the lowest in item "List of prohibited substances and methods should be published at least once every six months" (7.35%). In distribution of answers significant differences were observed in gender (with highest percentage of correct answers in male respondents; $\chi^2_{df=2}$=9.77 p=.008), branch of sport (with highest percentage of correct answers in representatives of individual sports; $\chi^2_{df=2}$=34.09 p=.000), young adults compared to adolescents and adults ($\chi^2_{df=4}$=11.79 p=.003) and athletes practising sport over 10 years, compared to those of 5-10 years of sports career, and less than 5 years of sports career ($\chi^2_{df=4}$=43.04 p=.000).

Table 1

Summary of the significance of differences in the level of knowledge between groups of respondents emergent on the basis of their gender, age, branch of sport and length of sports career (for details see text)

	Gender		***Branch of sport***		***Age***		***Length of career***	
	$\chi^2_{df=2}$	*p*	$\chi^2_{df=2}$	*p*	$\chi^2_{df=4}$	*p*	$X^2_{df=4}$	*p*
Knowledge (general)	50.70	.000	27.49	.000	32.78	.000	126.66	.000
Knowledge of rights and duties	2.62	.271	27.58	.000	2.42	.298	45.50	.000
Knowledge of procedures	9.77	.008	34.09	.000	11.79	.003	43.04	.000
Knowledge of substances and methods	52.46	.000	58.02	.000	24.87	.000	64.37	.000

Sources of knowledge on doping

Respondents were asked to provide information about sources from which they derive their knowledge on doping. 769 respondents answered the question. For 527 (68.53%) of them the primary source of information on doping was TV, for 415 (53.97%) internet, for 414 (53.84%) peers, for 283 (36.80) a coach, for 187 (24.32%) sports magazines and newspapers (especially body-building magazines, like Muscle, Flex, Men's Health etc., but also specialist magazines, like Swimming, Basketball, Soccer etc.), for 87 (11.31%) books (scientific as well as investigating journalism). 76 persons (9.88%) were exposed to anti-doping control. 19 (2.47%) persons provided another sources of information in the space provided. These sources included physicians, studies on the Academy of Physical Education and/or school, parents, leaflets in sports clinics, and own experiences (taking drugs).

Table 2

Sources of knowledge on doping in examined population

Source	*N*	*%*
Television	527	68.53
Internet	415	53.97
Peers	414	53.84
Coach	283	36.80
Sports magazines and newspapers	187	24.32
Books	87	11.31
Being exposed to anti-doping control in the past	76	9.88
Other	19	2.47

Conclusions:

- Knowledge of Polish athletes concerning doping and anti-doping policy is unsatisfactory and its level is related to some socio-demographical variables, like gender, age, branch of sports discipline and length of sports career.
- Relatively better level of knowledge was observed in items concerning awareness of rights and duties of an athlete towards anti-doping controls
- Only minority of respondents drew their knowledge on doping from sources that could be regarded as reliable with reservation that internet which as the second in importance was not described in details (it can be a source of reliable knowledge promoted by anti-doping bodies,

like the Polish Commission Against Doping in Sport, as well as source of web sites of doubtful value from the point of view of anti-doping policy)

Attitudes toward doping-free sport and anti-doping policy

Attitudes were measured by a questionnaire consisting of 20-items scored on a 5-point Likert scale ranging from 1 (definitely no) to 5 (definitely yes), with some items reversely worded. Four subscales were included into the scale:

1/ attitudes toward anti-doping controls, for example "Anti-doping controls are unnecessary and should be canceled", "Anti-doping controls are essential in struggle for clean sport". Reliability of the scale evaluated by Cronbach's alfa coefficient was .63, while values threshold of .60 is considered as acceptable by A. Sokołowski and A. Sagan (1999).[1]

2/ attitudes toward sanctions for violating anti-doping rules, for example „Punishing athletes who violate anti-doping rules is fair because it protects interests of 'clean' athletes", "Punishing athletes who violated anti-doping rules is wrong because it can ruin their careers". Reliability of the scale was alfa = .66.

3/ attitude toward ethical rationale of anti-doping policy, for example "Legalization of doping would be beneficial for athletes who could take it under medical control", "Ethical rationale of anti-doping policy is doubtful". Reliability of the scale was alfa .64.

4/ behavioral disposition (expressed readiness) of an athlete to use doping, for example "I would be willing to use doping if it guarantees me winning in a competition", "I could never risk my health taking doping" Reliability of the scale was .77.

Mean score of general attitude (mean of scores of four subscales) was 3.90 (SD .07) and indicates that the direction of attitude of respondents is favourable, however rather moderate in strength. From four subscales the highest mean (i.e. attitude most favourable to doping-free sport and anti-doping policy) was observed in attitudes toward anti-doping controls (M 4.12 SD .82), the lowest (i.e. still favourable, although close to the point of neutrality or ambivalence of the attitude) in attitude toward sanctions (M 3.68 SD .79). Means of each subscales differed from one another: Wilk's λ .74 $F(3, 782)=89.34$ $p=.000$, Tukey's post hoc test showed that differences between each all subscales were significant.

To examine if there are differences in attitudes related to gender, age, branch of sport and length of sports career one-way ANOVA's for four dependent variables were conducted

[1] Sokołowski, A., Sagan, A. (1999). Analysis of data in marketing and public opinion research. In: Examples of statistical inference with the use of Statistica. [in Polish]. (Warsaw, Statsoft), 8-12.

followed by one-way ANOVA's for each dependent variable separately, with accompanying post hoc tests. Significant differences in attitudes were observed in gender and age: respectively, Wilk's λ .96 F (4, 780)=8.55 p=.000 and Wilk's λ .95 F (8, 1558)=4.63 p=.000. Comparing male and female respondents for each dependent variable it turned out that in all four cases female athletes declared more favourable attitudes toward doping-free sport and anti-doping policy than males. In relation to age it turned out that young adult athletes declared more favourable attitude toward controls, attitude toward sanctions and attitude toward ethical rationale; while adolescent athletes declared more favourable attitude toward behavioral dispositions. In all four attitudes adult athletes scored significantly lowest i.e. their attitudes was positive in direction, but their strength was the weakest).

There were no differences between team and individual sports: Wilk's λ .99 F (4, 780)=1.68 p=.152, as well as between athletes whose sports career lasted less than 5 years, 5-10 years and over 10 years: Wilk's λ .98 F (8, 1554)=1.41 p=.187. However, in case of the latter one-way ANOVA's for each dependent variable made separately showed significant difference in behavioral dispositions: F (2, 730)=3.74 p=.024. Athletes with the shortest career declared the least behavioral readiness to take doping comparing to those whose career was longer than 5 years.

Table 3

Descriptive statistics and results of ANOVA with accompanying post hoc tests in relation to attitudes toward doping-free sport and anti-doping policy.

		Gender			**Age**				**Branch of sport**			**Career length**			
		M	F	ANOVA** $F_{(1, 783)}$	≤17	18-24	≥25	ANOVA** $F_{(2, 782)}$, post hoc***	Team	Individ.	ANOVA** $F_{(1, 783)}$	≤5	5-10	≥10	ANOVA** $F_{(2, 730)}$, post hoc***
		ANOVA* $F_{(4, 780)}$= 8.55 p=.0000			ANOVA* $F_{(8, 1558)}$ = 4.63 p=.0000				ANOVA* $F_{(4, 780)}$=1.68 p=.1516			ANOVA* $F_{(8, 1554)}$ = 1.41 p=.1870			
Controls	M	4.05	4.26	F=10.54	4.03[a]	4.21[ab]	3.86[b]	F=8.37	4.12	4.12	F= .00	4.15	4.17	4.00	F= 2.54
	SD	.85	.72	p =.0012	.78	.79	.96	p =.0003	.82	.81	p =.9609	.78	.78	.91	p =.0796
Sanctions	M	3.61	3.85	F=14.99	3.59[a]	3.77[a]	3.53	F=5.77	3.66	3.74	F=2.22	3.73	3.72	3.58	F=1.91
	SD	.83	64	p =.0001	.77	.77	.84	p =.0032	.79	.79	p =.1371	.77	.77	.84	p =.1492
Ethics	M	3.76	3.96	F=12.49	3.74[a]	3.91[ab]	3.61[b]	F=7.66	3.80	3.87	F=1.95	3.82	3.85	3.78	F=.43
	SD	.76	.71	p =.0004	.71	.75	.80	p =.0005	.73	.78	p =.1626	.75	.76	.76	p =.6499
Behavior	M	3.85	4.24	F=32.02	4.04[a]	4.00[b]	3.63[ab]	F=7.22	3.99	3.95	F=.36	4.05[a]	4.00	3.79[a]	F=3.74
	SD	.93	.81	p =.0000	.87	.92	.87	p =.0008	.88	.96	p =.5478	.86	.94	.88	p =.0242

* multivariate test, one-way ANOVA for four dependent variables

** univariate test, one-way ANOVA separately for each dependent variable

*** means bearing the same superscript do not differ significantly from each other in post hoc ($p<.05$)

As a completion of quantitave analysis of attitudes, some qualitative data were also collected written in extra space in the questionnaire provided for athletes wanting to express their opinion about doping, chances and perspectives of struggle for drug-free sport. Only 52 respondents used this opportunity. Nearly half of them (n=23) definitely declared their anti-doping attitude, for example "In my opinion anti-doping controls are very important, because I don't want to compete with someone who was not fair. Unfortunately many world famous stars who were role models for me, turned out to be doping cheaters", "There should be more anti-doping controls in sport for the game to be fair". Eight respondents defined themselves as supporters of legalization of doping in sport, for example "Anti-doping controls should be abolished. All athletes take doping and only the unlucky ones are detected, because they took this stuff too long or because of shortage of money they used drugs of poor quality", "Anti-doping controls should be abolished - everyone will be taking drugs and the chances will be equal. The present situation is unjust because drugs are taken only by those who know how to get them". Opinions of 20 respondents expressed their pessimistic view about perspectives of clean sport, but without declaring their support or lack of support for the present anti-doping policy, for example "There will always be doping in sport, because every record can be improved and each athlete wants to be the best. Clean competition recedes into the background. Sport became a way of earning a living, and for money athletes will do anything", "Doping is one of the phenomena that will always accompany sport, especially in its highest level. Some people will be thinking up better and better methods of detecting doping while others will invent new drugs that are more and more effective and harder to detect. One person expressed ambivalent opinion that "Anti-doping controls should be more frequent but sanctions for taking performance-enhancing drugs should be eased".

Conclusions:

- Direction of attitudes of examined athletes was positive, however its strength is moderate, which calls for more education which should be focused not only on cognitive aspects doping and anti-doping policy, but also on its ethical issues including argumentation in aid of maintaining anti-doping policy.
- The most favourable was attitude toward anti-doping controls, the least - in attitude toward sanctions. This discrepancy was best illustrated by one of the athletes who expressed their opinion in the space provided: "Anti-doping controls should be more frequent but sanctions for taking performance-enhancing drugs should be eased"
- Attitudes turned out to be influenced by some socio-demographical variables, especially gender and age, and not by branch of sport, however, more research is needed in this respect.

Relationship between goal orientations and attitudes toward doping

To measure achievement goal orientation Perceptions of Success Questionnaire (POSQ) was used. The questionnaire was translated into Polish in accordance with translation-back-translation procedure. POSQ consists of 12-items anchored to the stem "when playing sport, I feel most successful when …" Six items are designed to measure task Orientation (eg "I show clear personal improvement", "I perform to the best of my ability", "I master something I could not do before"), while the remaining six to measure ego orientation (eg "I am the best", "I outperform my opponents", "I can do something few others can"). Each item is rated on a 5-point Likert-type scale from 1 - "strongly disagree" to 5 - "strongly agree". Reliability of the questionnaire was satisfactory with Cronbach's alfa .83 for ego, and.76 for task orientation subscale.

First, correlational analysis of the study variables showed that there are significant correlations between all of them ($p<.001$). Ego orientation was negatively while task orientation was positively correlated with both general attitude score and scores of four attitude subscales. For the general attitude score the correlations were $r= -.23$ and $r=.22$, respectively.

Second, because of orthogonality of goal orientations, participants were divided into four mutually exclusive groups based upon their mean scores on task (3.87) and ego (3.02) orientation: high ego/high task (HE/HT; n=201), low ego/high task (LE/HT; n=253), high ego/low task (HE/LT; n=179) and low ego/low task (LE/LT; n=201). In analysing relationships between goal orientations and attitudes toward doping, first, a one-way MANOVA was conducted to examine if there are significant differences between goal orientation groups and an item scores of four attitudes toward doping. The result of the test indicated that the differences were significant: Wilk's λ .90 $F(12, 1979)=6.56$ $p=.000$. In the second step of analyses, four one-way ANOVA's were conducted showing that there are differences ($p<.001$) in all four subscales. In all four cases the highest score (i.e. the most positive attitude) was obtained for LE/HT group, while the lowest for HE/LT group. As post hoc Tukey tests showed scores of both these groups were significantly different in all subscales. In subscales measuring attitudes toward sanctions and behavioral dispositions the differences between scores of LE/HT group and HE/HT group were not significant.

Table 4

Descriptive statistics and differences between goal orientation groups in attitudes toward doping-free sport and anti-doping policy

	ANOVA $F_{(3, 751)}/p$	***HE/HT n=160***	***LE/HT n=253***	***HE/LT n=179***	***LE/LT n=201***	***Post hoc p***	
MANOVA	Wilk's $\lambda = .90$, $F_{(12, 1979)} = 6.56$, $p = .000$						
Controls	12.08/.000	4.02^{a}	4.36^{abc}	3.90^{b}	4.10^{c}	$^{a}.001$	$^{b}.000$
		.79	.69	.93	.82	$^{c}.010$	
Sanctions	7.24/.000	3.69	3.86^{ab}	3.54^{a}	3.58^{b}	$^{a}.001$	$^{b}.002$
		.77	.72	.87	.77		
Ehics	13.66/.000	3.69^{a}	4.04^{abc}	3.60^{bd}	3.84^{cd}	$^{a}.000$	$^{b}.000$
		.75	.73	.77	.70	$^{c}.041$	$^{d}.018$
Behavior	17.17/.000	4.01^{a}	4.26^{bc}	3.65^{ab}	3.86^{c}	$^{a}.002$	$^{b}.000$
		.86	.82	.92	.95	$^{c}.000$	

Note: mean values bearing the same superscript were significantly different

Third, in order to check relationships between goal orientations and attitudes toward doping, multiple regression analyses were performed. It was revealed that ego orientation is significantly negatively related to, and task orientation is significantly positively related to attitudes toward doping (B coefficients in ego orientation ranged from -.14 in the case of "sanctions" subscale to -.21 in the case of "controls" subscale; B coefficients in task orientation ranged from .12 in the case of "ethics" subscale to .32 in the case of "behavioural dispositions" subscale). It means that with the increase in task orientation attitudes toward doping become more positive, while increasing in ego orientation – more negative. However, it should be noticed that in all cases the models explained only a small portion of variance – for total score of attitude less than 10%.

Table 5

Multiple regression analyses assessing influence of goal orientations on attitudes toward doping-free sport and anti-doping policy

	B	***t test***	***p***
Controls $F_{(2, 781)}=26.04$, $p=.0000$, $R^2=.06$			
Ego	-.21	-5.65	.000
Task	.19	4.08	.000
Sanctions $F_{(2, 780)}=20.87$, $p=.0000$, $R^2=.05$			
Ego	-.14	-3.43	.001
Task	.25	5.19	.000
Ethics $F_{(2, 772)}=21.72$, $p=.0000$, $R^2=.05$			
Ego	-.20	-5.69	.000
Task	.12	2.88	.004
Behavior $F_{(2, 777)}=30.33$, $p=.0000$, $R^2=.02$			
Ego	-.18	-4.18	.000
Task	.32	6.26	.000

It is interesting to note that when relationships between goal orientations and attitudes toward doping were tested for goal orientation profile groups separately, it turned out that significant differences were observed in groups HE/HT and LE/LT. Within the former it was ego orientation that was significantly related to attitude, suggesting that when athletes are high ego and high task oriented it is ego orientation that exerts stronger (and negative) influence on attitude. Within the latter significant relationships was observed mainly within task orientation.

Conclusions:

- A high task, low ego achievement goal orientation profile is most positively associated with attitudes toward doping and anti-doping policy.
- With increase in task orientation increase, while with increase in ego orientation decrease in strength attitude was observed.
- The results suggest that creating a motivational climate which promotes task orientation may be important not only for maintaining long term motivation toward practising sport and for sportpersonship, but also for attitudes toward doping and anti-doping policy

Intention to publish

At least two publications are planned:

1/ a paper describing results on knowledge and attitudes was sent to journal "Human Movement" published in English;

2/ a paper describing results on relationships between attitudes toward doping and goal orientations is being prepared and will be sent to one of international journals in sport and exercise science.

Apart from abovementioned a third publication is considered. Because all analyses done on the whole sample were repeated for the sub-sample consisting of young sportsmen studying in the "schools of sports championship", a paper presenting their knowledge and attitudes is considered. The schools were brought into being with an idea to facilitate sport development of talented youth and facilitate reconciliation of sports development and studying. The schools are a particularly appropriate place for anti-doping educational campaign because it can be included into school curriculum and therefore to be systematic and based upon existing structures. In fact there are ethic in sport classes in some of these schools already.

Knowledge of Anti-Doping Code and anti-doping policy

(translated from Polish)

Anti-doping controls may take place only during competitions	true	false	don't know
Prohibited substances may be present in common medicines and sports supplements	true	false	don't know
If an athlete was found positive, but prohibited substance was present in medicine prescribed by a physician, its the physician who is guilty, not the athlete	true	false	don't know
Caffeine is a prohibited stimulant	true	false	don't know
If a substance is produced naturally in human organism it shouldn't be included in the list of prohibited substances and methods	true	false	don't know
There is no necessity for an athlete to know anti-doping rules, because it is a coach's and physician's duty to be familiar with them	true	false	don't know
Creatine is a prohibited substance belonging to a class of anabolic agents	true	false	don't know
If an athlete was exposed to anti-doping control, the next such control may take place not earlier than after a month	true	false	don't know
An athlete can take prohibited substances if (s)he is ill, and received special permission	true	false	don't know
Anabolic steroids have good effect on complexion	true	false	don't know
Immediately after anti-doping control, an athlete has the right to receive a copy of its record	true	false	don't know
If a prohibited substance was found in athlete's sample A, an athlete has the right to be present at opening and analyzing of sample B	true	false	don't know
Nobody can reduce an athlete in pouring sample of his/her urine to containers send to laboratory	true	false	don't know
The side effect of ephedrine taking is an increase in muscle mass	true	false	don't know
An athlete receives a notification about the result of anti-doping control both when it is negative as well as positive	true	false	don't know
An athlete is not allowed to be accompanied by other persons in doping control checkpoint	true	false	don't know
Anti-doping analyses can be performed by any laboratory which has specialist equipment	true	false	don't know
If an athlete will not appear in anti-doping control checkpoint despite receiving proper notice, he/she will be recognized guilty of breaking anti-doping rules	true	false	don't know
After positive result of anti-doping control an athlete has the right to appeal against it during seven days	true	false	don't know
An athlete is fully responsible for each substance found in his/her body, even for prohibited substances which were taken unintentionally	true	false	don't know
The list of prohibited substances and methods should be published at least once half a year	true	false	don't know
Among prohibited substances and methods some are prohibited only in competitions, and some both In competitions and in training	true	false	don't know
Anabolic steroids are prohibited only during competitions and are not controlled out of them	true	false	don't know
In Poland anti-doping actions are conducted by PKOl Medical Commission	true	false	don't know
The staff of an anti-doping laboratory knows personal data of athletes	true	false	don't know

whose samples they examine

Using anabolic steroids can lead to depression and mood disturbances	true	false	don't know
Physician or coach who encourage an athlete to take doping can be called to account for it	true	false	don't know
Using steroids can raise the level of "bad cholesterol" in blood	true	false	don't know
Anabolic steroids improve aerobic endurance	true	false	don't know
Marihuana is considered prohibited doping substance	true	false	don't know
Stimulants are substances that stimulate central nervous system and can mask fatigue	true	false	don't know
Anabolic steroids can lead to excess growth of heart muscle	true	false	don't know
In some sports alcohol is considered a prohibited doping substance	true	false	don't know
Current anti-doping rules are collected in the so called IOC's Anti-Doping Manifest	true	false	don't know
An athlete who was drawn to anti-doping control is obliged to immediately stop his/her training an go to anti-doping control checkpoint	true	false	don't know
Insulin is not a prohibited substance	true	false	don't know
The only way to call an athlete for an anti-doping control is a draw	true	false	don't know
An athlete who set the record but violated an anti-doping rule is disqualified but his score remains uncanceled	true	false	don't know
Using some diuretics is prohibited	true	false	don't know
If an athlete was tested positive for two prohibited substances, for which different sanctions are provided, the more severe will be imposed	true	false	don't know
Gene manipulations are now considered prohibited methods	true	false	don't know
An athlete has the right to refuse to undergo doping control	true	false	don't know
Ten years is the maximum period of disqualification for doping	true	false	don't know
EPO is a prohibited substance used in power sports to increase muscle mass	true	false	don't know
Growth hormone is allowed as an ergogenic aid	true	false	don't know

Sources of knowledge on doping

From what sources do you derive your knowledge :

☐ magazines and newspapers, which? ……

☐ books, which? ……

☐ coach, instructor

☐ peers

☐ television

☐ I was controlled

☐ internet

others ……

Attitudes toward doping-free sport and anti-doping policy

(translated from Polish)

1 – definitely no 2 – no 3 – don't know 4 – yes 5 – definitely yes

According to me ..

Anti-doping controls are unnecessary and should be canceled	1	2	3	4	5
Lifetime disqualification for doping is too severe consequence	1	2	3	4	5
Doping is unfair way of gaining advantage	1	2	3	4	5
I could take prohibited substance	1	2	3	4	5
Anti-doping controls are necessary in struggle for clean sport	1	2	3	4	5
From moral point of view the use of doping is indifferent	1	2	3	4	5
Sanctions for the use of doping should be milder	1	2	3	4	5
Doping is good for sport, because it enables its development	1	2	3	4	5
Anti-doping controls invade athlete's privacy	1	2	3	4	5
Punishing athletes who violated anti-doping rules is wrong because it can ruin their careers	1	2	3	4	5
Legalization of doping would be beneficial for athletes who could take it under medical control	1	2	3	4	5
There should be severe penalties for doping to deter athletes from it	1	2	3	4	5
I would be willing to use doping if it guaranteed me winning in a competition	1	2	3	4	5
Anti-doping rules violate athlete's rights to self-determination	1	2	3	4	5
Punishing athletes who violate anti-doping rules is fair because it protects interests of 'clean' athletes	1	2	3	4	5
If I knew I would win if I took doping, I could surely do it	1	2	3	4	5
Ethical rationale of anti-doping policy is doubtful	1	2	3	4	5
I could never risk my health taking doping	1	2	3	4	5
Anti-doping controls are very necessary in sport	1	2	3	4	5
There is no such pressure that could force me to take doping	1	2	3	4	5

Perception of Success Questionnaire

When playing sport, I feel most successful when:

1 - strongly agree 2 - agree 3 - neutral 4 – disagree 5 - strongly disagree

I beat other people	1	2	3	4	5
I am clearly superior	1	2	3	4	5
I am the best	1	2	3	4	5
I work hard	1	2	3	4	5
I show clear personal improvement	1	2	3	4	5
I outperform my opponents	1	2	3	4	5
I reach a goal	1	2	3	4	5
I overcome difficulties	1	2	3	4	5
I reach personal goals	1	2	3	4	5
I win	1	2	3	4	5
I show other people I am the best	1	2	3	4	5
I perform to the best of my ability	1	2	3	4	5