

Attitudes towards use of performance-enhancing
substances and body modification techniques.

A comparison between elite athletes and the general population

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Abstract

Medical and technological developments open up new possibilities for modifying the body and enhancing performance in various areas of life. The study compares attitudes among Norwegian elite athletes (n = 234) with attitudes in the general population (n = 428). Whereas vitamins, nutritional supplements and hypoxic rooms were accepted by more than 65 percent of both athletes and population the rejection of EPO, anabolic steroids and amphetamines were similarly clear in both groups. The athletes were in general more reluctant to use means of performance enhancement and body modification techniques than the general population. A significantly higher percent of the population than the athletes accepted a) means to avoid memory failure in high age (61,6 versus 43,2, sig. .000), b) means to avoid decrease in physical fitness among old people (48,6 versus 34,7, sig .005), c) liposuction (30,1 versus 12,4, sig .000), d) surgery to eat much (15,3 versus 9,4, sig .035), e) silicon implants (9,9 versus 5,1, sig .001). The athletes were significantly more satisfied with their bodies than the population (sig .000).

Males were more positive towards means of performance enhancement, whereas females were more positive towards body modification techniques.. Males were significantly more positive towards use of a) means that increase strength and endurance (sig .002) b) means that increase sexual performance (sig .000). Females were significantly more positive than males towards use of liposuction (sig .000), plastic surgery on face (sig. 013), surgery to eat much (sig. 000), silicon implants (sig. 000).

Key words: Elite athletes, doping, performance enhancement, body modification

Medical and technological developments open up new possibilities for enhancing performance in various areas of life. Not only athletes but many people in the general population use various pharmaceutical and technological means to increase physical as well as other types of performance. We also witness a growing number of body modification techniques such as plastic surgery and liposculpture that alter the appearance of the body. In the near future it may be possible to go even further. Genetic technology may enable the transfer of synthetic genes into human cells, where they become impossible to distinguish from a person's own DNA. Theoretically, athletes and

others can receive genes that can slow down muscle atrophy, accelerate metabolism or enhance muscle performance. We may also think of drugs and perhaps genetic techniques that will modify mental qualities such as creativity, memory, empathy, and stress tolerance.

These possibilities open new contested terrain and challenge established conceptions of ‘the natural’ and of a morally responsible development. The moral status of enhancement techniques is the subject of heated philosophical debate with, on the one side, rather restrictive views and calls for regulation, and, on the other side, liberal views and arguments for more open and non-restrictive policies.¹

The ambiguous status of enhancement technologies is reflected in the general population as well. There is reason to expect a variety of views based on differences in individual values and attitudes, in socio-cultural contexts as well as in practice-specific preferences. For example, due to the crucial role of physical performance and appearance, practices and institutions such as ballet, circus, fashion, the movie industry, body building and elite sport, seem more exposed to physical enhancement than others.

In sport, especially at elite levels, there is a long tradition of experimentation and use of performance-enhancing methods and substances.² With the establishment of the World Anti-doping Agency (WADA) in 1999, sport has developed relatively strict anti-doping regimes to control excessive use of such means.³ However, the anti-doping campaign is contested both in terms of its effectiveness in controlling actual use and its effects on attitudes among athletes and the general public. Some even see the use of drugs as an integrated part of competitive sport and claim that the ban on their use cannot be justified.⁴ Furthermore, we know little about the broader picture when it comes to attitudes towards various types of enhancement and body modification techniques. Overviews offered by among others Houlihan, Waddington, and Lueschen show that there is need for more extensive studies in this respect and for explanations that can shed reflexive light upon this development.⁵

This article attempts to fill some of these gaps in the literature. Do developments within sport simply reflect the attitudes and practices of enhancement and body modification in larger society? Are there more liberal views in sport than in the general population, or is sport a conservative and purist enclave in an increasingly liberal society

in these matters? Answers are sought by providing an in-depth view of the attitudes among elite athletes compared to a matched age group in the general population in relation to a broad range of performance enhancing and body modification means and methods.

Background: Enhancement means and methods in sport and in society

The use of performance-enhancing drugs in sport seems to be as old as sport itself.⁶ In general, such use was not considered really problematic until the early 1960s when new substances such as anabolic steroids and amphetamine led to several deaths during sport performances.⁷ The IOC passed a resolution condemning doping in 1962 and in then in 1964 defined and banned the use of a series of drugs and methods. The initiative was soon followed by the rest of the sport world. Drug use was not only considered a significant threat to athletes' health, but to the value and nature of sport, and is by most sport organizations considered perhaps the most important moral and health challenge to sport ever.⁸

In spite of the ban and the moral condemnation, the use of drugs seems to be prevalent. Houlihan and Waddington report that drug use seems to have increased significantly since anti-doping controls were introduced in 1964 and has spread from power, endurance and speed events into most sports.⁹ In the period 1993-2003, the percentage of positive A-sample tests has varied between 1,36 and 1,98 percent.¹⁰ However, many athletes are tested infrequently', and the controls do not cover all doping substances/techniques. There is reason to believe that the percentage of athletes using doping is higher than what appears in the IOC/WADA statistics.¹¹ The use of performance-enhancing drugs in sport can be intimately linked to the logic of sport, and to societal ideals.¹² Competitive sport at high levels of performance is dominated by a constant quest for improvements, records, and new victories. The use of banned drugs and methods can be considered a rational strategy in this process.¹³ In highlighting values such as individualism, performance, and scientific and technological progress, sport can be considered a paradigmatic case of the key values of modernity.¹⁴ These values seem to be driving forces of several more general social processes in modern society. One such process is that of medicalization. Building on work from Irving Zola from the early

1970s, Murphy and Waddington argue that medicine has become a major institution of social control.¹⁵ Discourses linked to health and illness have gained significance in the daily lives of an increasing number of people. The discourses are particularly strong in sport and in the fitness industry with the creation of a plethora of medically produced means and technologies to improve health and to create a healthy image.¹⁶ It seems to be only a short step from the idea of a healthy life to the idea of an enhanced life.¹⁷ A brief glance on various statistics of medicine consumption confirms that the borders between therapy and enhancement have become blurred.¹⁸ One example is the increased steroid use among adolescents outside sport. A UK survey of 20 UK towns and cities shows that the use of anabolic steroids is becoming mainstream as young men turn to the drugs to boost self-confidence and improve body image.¹⁹

Another social process of significance to performance enhancement and body modification is the individualization process, that is, the shift in attitudes and practices from collective to individual values.²⁰ We live in a culture with a strong ethos of self-realization – an ‘ethics of authenticity’, to use Charles Taylor’s phrase.²¹ Self-realization can take the form of a self-construction where the athletic ideal of performance spills over into new life dimensions like creativity, sexual performance and emotional involvement. People have the possibility of enhancing performance and for many there is a concomitant expectation of increased life quality and gratification of needs.

In addition to medicalization and individualization, a third social process of relevance in this respect is that of visualization. Modern Western culture is often described as a visual culture in which images and appearance play key roles.²² The body can be understood as a social symbol signalling who we are and what we can achieve. The predominant ideal is that of the young, well-trained, slim body.²³ Commercial advertisements often use athletes as their visual models.²⁴ Parts of popular culture are exposed to what Grupe calls a ‘sportification process’, that is, to a strong impact of sport values.²⁵ In a recent study, Cohen et al. reported on the typical non-therapeutic anabolic steroid user as a Caucasian, highly-educated, gainfully employed professional approximately 30 years of age who was not active in organized sport and used steroids to improve muscle mass, strength and physical attractiveness.²⁶ The study demonstrates, too, a particular gendering of the ideals. Sport was for a long time considered to be a

male preserve where ideals of muscularity and toughness were pervasive. In modern sport the female identity construction has been given more room, but still the body construction is gendered. Males are supposed to be more involved in dangerous, muscular and aggressive sports. Females are expected to pursue sports that are aesthetic, controlled and safe. The ideals consequently focused on muscularity and hardness for males and aesthetics and leanness for females. Weight training, aerobics and the use of artificial means like steroids liposuction have become important factors to realize these ideals. Even the female body is now supposed to be well-trained, tight and fit. Body hardness and agility are considered key qualities not only for men. These ideals are particularly challenging to women, who, based on biological realities, have to strive more to meet the demands.²⁷ Women consequently, in most surveys, report a higher degree of dissatisfaction with their bodily appearance than men.²⁸

Research questions and hypotheses

Based on a sample of Norwegian elite athletes and a corresponding age group drawn from a representative sample of the Norwegian population above 15 years of age, we examined and compared attitudes among elite athletes and a matched reference group from the general population.

The first research question focuses on attitudes towards the use of existing means and methods of performance enhancement in sport, both legal and illegal. These include nutritional supplements, hypoxic rooms, EPO and anabolic steroids.

The second research question widens the perspective: with the proviso that use may lead to a decrease in life length, what are the attitudes towards the use of hypothetical means and methods of performance enhancement in sport, in mental activities, in social life, and in sexual life?

The third research question concerns attitudes towards body modifications. With the proviso that use may lead to a decrease in life length, what are the attitudes towards the use of actual and hypothetical means and methods to modify body appearance? These methods include bio-chemical substances, plastic surgery, silicon implants, liposuction and tattoos.

The 0-hypothesis is that the views of athletes simply reflect attitudes in the general population. There are however several arguments that can be raised against this. Due to the strong emphasis on performance and improvement, one might expect elite athletes to be more tolerant or liberal in their attitudes to enhancement. This active orientation might also be expected in relation to body modifications. In many sports there are weight classes and in even more sports there is pressure to optimize body weight, in most cases in the direction of thinness and lightness. Athletes are used to modifying their bodies as part of a continuous and tough race for competitive advantages.

Materials and methods

The article uses two data samples. The first sample is based on a survey of Norwegian elite level athletes who are registered in the testing pool, which means they have to provide their whereabouts information to the national anti-doping agency (Anti-Doping Norway). The sample consists of 234 athletes (response rate 80.8 percent) on the national or international elite level. The sample consists of 151 men and 83 women. Forty-five percent of the athletes have medals from the Olympics or world championship. In the athletes' group 68.7 percent represent Olympic sports, 21.4 percent non-Olympic sports and 9.9 percent Paralympic sports. The athletes were between 16 and 51 years old. The data were gathered between 11 October and 13 November 2006. Questionnaires were sent out to all 292 athletes in the testing pool. Six questionnaires were sent by mail and the rest (286) by e-mail. A web-based based system developed by QuestBack²⁹ was used. The questionnaires addressed questions relating to various aspects of doping/anti-doping work, such as whereabouts information, testing procedures and attitudes to various doping means. The survey was answered anonymously. The survey was ethically accepted by the Norwegian Social Science Data Services (NSD) and stored according to its guidelines.

The second sample is from the survey Norwegian Monitor and consists of a representative sample of the Norwegian population above 15 years of age. Norwegian Monitor has been conducted biannually since 1985. The 2005 sample consists of 3849 respondents. Data were collected by telephone interview and questionnaire. The study addresses a wide variety of topics related to attitudes, values and behavior in various

areas of life, including sport. The introductory questions are asked by an interviewer. Of those contacted by telephone, 65 percent filled out and returned the questionnaire. Data were collected and stored anonymously and according to the ethical guidelines of the National Committee for Research Ethics in the Social Sciences and the Humanities (NESH) and the Norwegian Social Science Data Services (NSD)

A few athletes were below 18 or above 35. These were scattered cases in relation to the age distribution curve of the athletes. Since more than 90 percent of the athletes were between 18 and 35 years old, this age group was extracted from the Norwegian Monitor sample. The group consisted of 791 persons; 275 male and 516 female respondents. In order to have the same ratio of men and women in both groups, a random sample of 153 women was extracted from the population group. The population group then consisted of 275 men and 153 women. In order to have as much statistical power as possible all athletes in the Norwegian whereabouts testing pool were asked to participate. Similarly as many subjects as possible were extracted from the population sample given the parameters and ratios of sex and age in the athlete sample. Data were analyzed with SPSS 15.0.1 for Windows.³⁰ Since ordinal scales were used and the assumptions of normal distribution were not met non-parametric tests were used. To compare samples we used two-independent-sample Mann-Whitney tests. To measure associations between variables two-tailed bivariate correlation tests with Kendall's tau-b were used.

Results

The first research question was related to traditional means of improving performance in elite sport. Attitudes towards both forbidden and accepted means were examined. The results are presented in table 1.

Table 1. ‘Among elite athletes different forms of performance-enhancing substances are used in addition to physical training. Below different means are listed that, to varying degrees, affect the performance of the body. Which of these means do you think should be accepted and which should not be accepted?’ Norwegian elite athletes (EA), n=234. General Population, age group 18-35 (GP,) n=428. Percentages.

	Can be accepted		Can be accepted with reservations		Cannot be accepted		Cannot answer/ not answered	
	EA	GP	EA	GP	EA	GP	EA	GP
<i>Nutritional supplements like cod-liver oil. vitamins and minerals</i>	98.7	97.2	0.9	1.7		0.2	0.4	0.9
<i>Nutritional supplements that increase the ability of the body to recover after hard training</i>	46.2	46.8	27.4	36	17.5	12.1	8.1	4.5
<i>Hypoxic rooms that increase the production of red blood cells and thereby increase endurance capacity</i>	36.8	37.2	28.6	39.1	26.9	17.3	6.8	6.4
<i>EPO and other substances that increase endurance capacity</i>		2.9		6.2	96.2	79	3.4	11.9
<i>Anabolic steroids, growth hormones and similar substances that make it possible to increase the amount of training and muscle strength</i>		1.7		2.1	96.2	93.1	3.4	11.9
<i>Amphetamine and similar</i>		0.7	0.4	1.2	96.2	95.7	3	2.4

<i>substances that increase the ability to endure hard training and pain in competitions</i>								
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A Mann-Whitney test was performed to see whether the differences between the groups were significant. The only significant difference was in relation to nutritional supplements like cod-liver oil, vitamins and minerals (sig .048).

We also looked at differences between men and women across both groups. A Mann-Whitney test showed that men were significantly more positive than women towards the use of nutritional means to help recovery (sig .001), hypoxic rooms (sig. .0008) and EPO (sig .028).

In order to get a clearer overview of the total percentage that to some degree accepts traditional enhancements, we collapsed the alternatives ‘can be accepted’ and ‘can be accepted with reservations’ into one category. Figure 1 shows the percentage of the respondents in the two groups that are positive to some degree to the use of various substances.

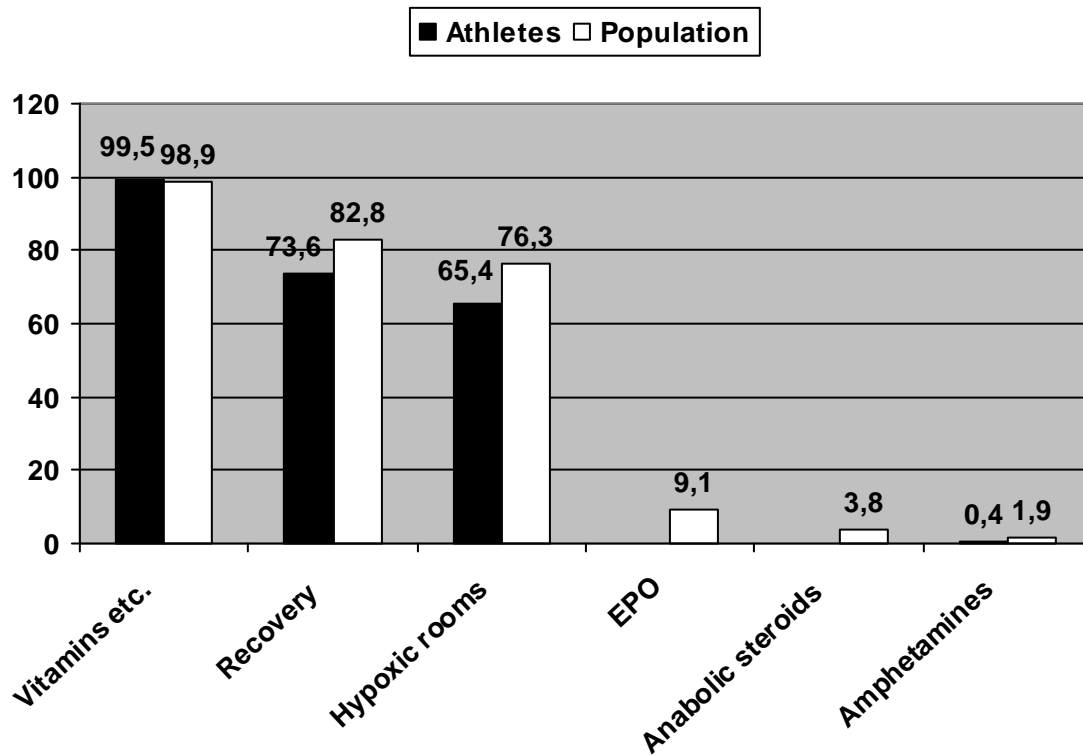


Figure 1. The percentage of respondents that answer that various types of performance-enhancing substances “can be accepted” or “can be accepted under doubt”. Norwegian elite athletes (EA), n=234. General Population, age group 18-35 (GP) n=428.

The results show that there is an almost unanimous acceptance of the use of vitamins and minerals and a corresponding unanimous rejection of the use of anabolic steroids, EPO and amphetamines. The athletes reported zero tolerance for such doping means and in the general population only a small percentage found such means acceptable to some degree. Both groups report a relatively high degree of acceptance of hypoxic rooms and nutritional supplements used for recovery. Among the athletes 65.4 percent responded that hypoxic rooms can be accepted or accepted with reservations. The general population seems to be even more positive. This stands in contradistinction to the ban on the use of hypoxic rooms enforced by the Norwegian Sport Federation. In 2007 WADA in fact evaluated the use of technologically created hypoxic rooms for the list of banned substances but decided not to ban it in the revision of the prohibited list in 2006.³¹

If both the athletes and the general population are so averse towards the use of doping means like EPO, anabolic steroids and amphetamines, it seems reasonable to expect that they welcome strict rules against doping and efficient anti-doping work. Our question was, then, whether the existing anti-doping work in Norwegian sports that already takes extensive financial resources¹ should be increased, held at the present level or reduced (table 2).

Table 2. 'The Norwegian Sports Federation uses a lot of money to prevent doping in sport. Do you think that this work should be increased, be held at the present level, be reduced or ended?' Norwegian elite athletes (EA), n=234. General Population, age group 18-35 (GP), n=428. Percentages.

	Should be increased	Should be kept at present level	Should be reduced	Should be ended	Do not know/ not answered
Elite athletes	31.6	53.8	3	0	10.,7
Population	59.2	35.1	0.7	1.2	3.8

A Mann-Whitney test revealed significant differences between groups (sig .026). The general population reports to be more eager to increase anti-doping work than the athletes. Almost 60 percent in the general population hold the view that anti-doping work should be increased whereas around 35 percent of the athletes think the same. Among the athletes there seems to be some reluctance to give their opinion since 10.7 percent provide no response. When we compared men with women, the men showed more interest in increasing the anti-doping work. 52.9 percent of the men, in contrast to 42.9 percent of the women, thought the anti-doping efforts should be increased. The difference was significant (sig. .026).

¹ Anti-Doping Norway receives about 19 million Norwegian kroner (2.3 million Euros) each year from the government.

The second main question was related to how the athletes and the general population respond to the possibility of legal substances and techniques that may enhance performance in various areas of life but with a possible health risk (table 3).

Table 3. 'In the future there may be produced legal substances that may increase performance in various areas of life. How willing would you be yourself to take the following substances if you at the same time ran a possible risk of a decrease in life expectancy?' Norwegian elite athletes (EA), n=234. General Population, age group 18-35 (GP), n=428. Percentages.

	Willing		May be willing		Not Willing		Cannot answer / not answered	
	EA	GP	EA	GP	EA	GP	EA	GP
<i>Substances that to a significant degree increase the ability to think creatively</i>	2.6	7.1	21.8	18.8	67.9	68.4	6	5.7
<i>Substances that reduce the failure of memory as a function of aging</i>	10.3	14.3	32.9	47.3	49.1	34.7	6.4	3.8
<i>Substances that reduce the decrease in physical fitness as a function of aging</i>	7.3	8.8	27.4	39.8	57.3	46.2	6.8	5.2
<i>Substances that increase the ability to tolerate work load/stress</i>	3	6.4	17.5	15.4	72.2	73.5	5.6	4.7
<i>Substances that to a significant degree increase your physical strength and endurance</i>	3	7.8	19.2	14.9	70.1	72.5	5.1	4.7
<i>Substances that to a significant degree increase your sexual ability</i>	3.4	5.2	22.6	28.7	64.5	60.7	7.3	5.5
<i>Substances that give you better</i>	2.1	4.7	18.8	11.1	70.1	76.8	6.8	7.3

<i>understanding of other peoples emotions</i>								
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A Mann-Whitney test revealed significant differences between the groups only in relation to substances that reduce the failure of memory as a function of aging (sig .000) and in relation to substances that reduce a decrease in physical fitness as a function of aging (sig .006)

When we compared men and women across the two groups the men were more positive about all types of enhancement. A Mann-Whitney test showed that men scored significantly higher in relation to creative thinking (sig .007), reduction in physical fitness (sig. .026), increase in physical strength (sig .000), and increase in sexual ability (sig .000).

In order to get a clearer overview of the positive attitudes we collapsed the alternatives ‘willing’ and ‘may be willing’ into one category. Figure 2 shows the percentage of the respondents that are accepting to some degree to the use of various substances.

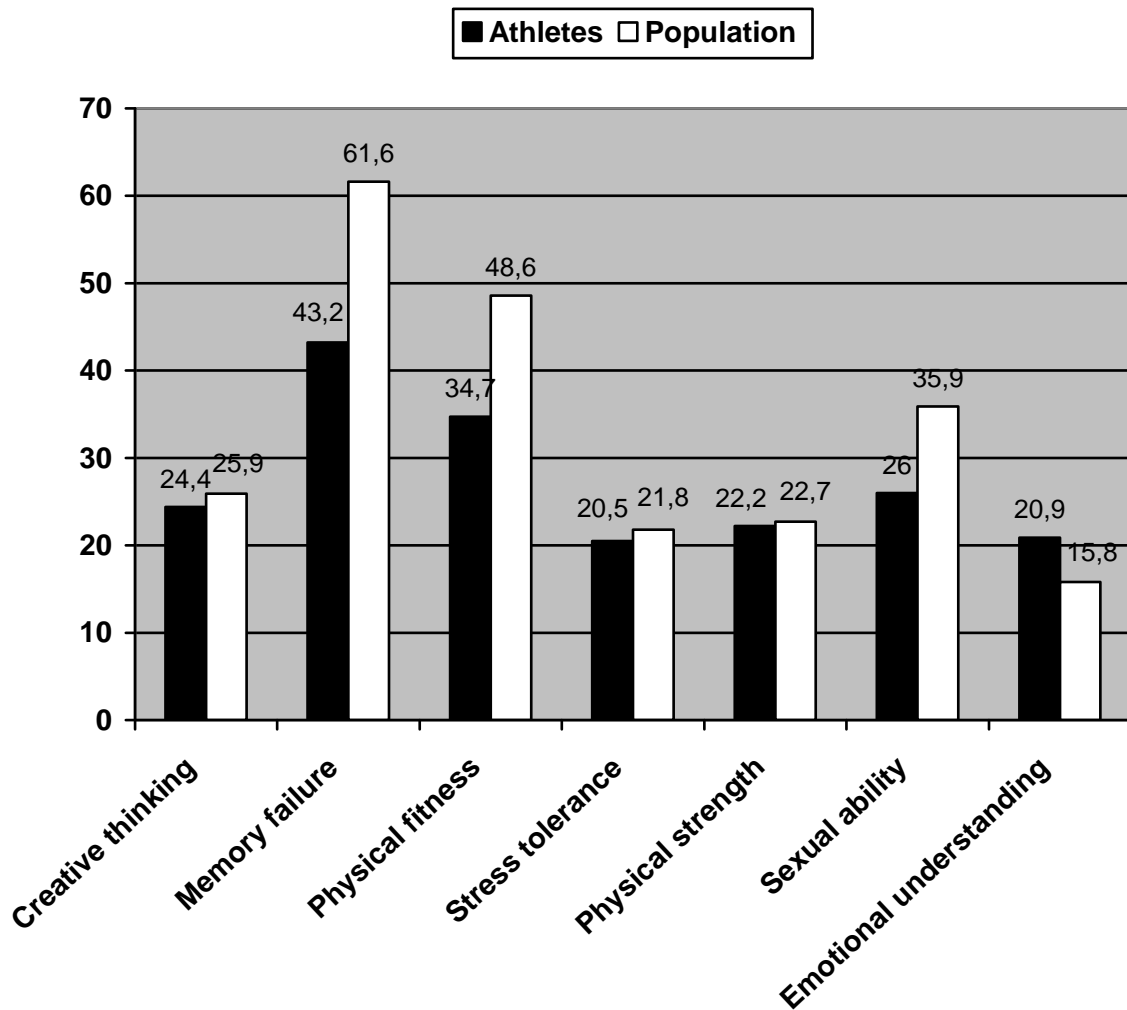


Figure 2. The percentage of respondents that are “willing or “may be willing” to use various types of performance-enhancing substances. Norwegian elite athletes (EA), $n=234$. General Population, age group 18-35 (GP) $n=428$.

The results indicate a higher degree of acceptance of these types of enhancement than of traditional doping means. This holds true for both the athletes and the general population. The acceptance rate varies from around 15 percent to 60 percent depending on area of life in which performance would be enhanced. Both the athletes and the general population are most accepting of the use of substances that reduce memory failure followed by substances that reduce decrease in physical fitness. In both these areas the difference between the groups is also largest, the population being significantly more positive to the

use of enhancements than the athletes. Also in relation to sexual function the general population is significantly more positive. In the other areas the differences between the groups are small. In the athletes' group 20-26 percent respond that they are willing or may be willing to use substances that improve creative thinking, stress tolerance, and physical strength. The results are similar in the general population. The only area where the athletes score significantly higher than the population is in relation to the use of substances which would improve emotional understanding. In general however the athletes seem to hold more restrictive attitudes to the use of enhancements.

The third research question relates to bodily appearance. We asked whether various body modifications should be accepted even if they involve some danger to one's health (table 4).

Table 4. 'In our society it is possible to alter appearance by different methods. How willing are you to use the following methods, if they involve health risks?'

Norwegian elite athletes (EA), n=234. Representative sample of the general population, age group 18-35 (GP), n=428. Percentages.

	Willing		May be willing		Not willing		Cannot answer/ not answered	
	EA	GP	EA	GP	EA	GP	EA	GP
<i>Take substances to get a muscular body</i>		3.6	3	4.8	94.4	90.5	1.3	1.2
<i>Have liposuction to the parts of your body that you are dissatisfied with</i>	0.9	6.8	11.5	23.3	84.2	67.5	1.3	2.4
<i>Have plastic surgery to alter your facial features</i>	1.7	2.6	6.8	11.3	89.3	85.1	0.4	0.9
<i>Have a surgical operation in order to be able to eat what</i>	2.1	3.5	7.3	11.8	88.9	82.5	0.4	2.1

<i>you want without adding weight</i>								
<i>Put silicon implants in your breasts or other places on your body in order to get a more attractive body</i>	1.3	2.8	3.8	7.1	89.3	86.8	3.8	3.3
<i>Use tattooing on parts of your body</i>	15.8	23.9	25.2	26	54.7	48.7	2.6	1.4
<i>Take substances to conserve a youthful appearance</i>	2.1	3.3	13.2	18.6	79.5	76.9	3	1.2

A Mann-Whitney test showed significant differences between groups in relation to the acceptance of liposuction. (sig .000) and in relation to tattooing on parts of the body (sig .045)

A comparison between men and women showed that women scored significantly higher than men in relation to acceptance of liposuction (sig .000), facial surgery (sig .039), surgery to control eating (sig .000) and silicon implants (sig .000).

In order to get a clearer overview we collapsed the alternatives ‘willing’ and ‘may be willing’ into one category. Figure 3 shows the percentage of the respondents that are positive to some degree to the use of various techniques.

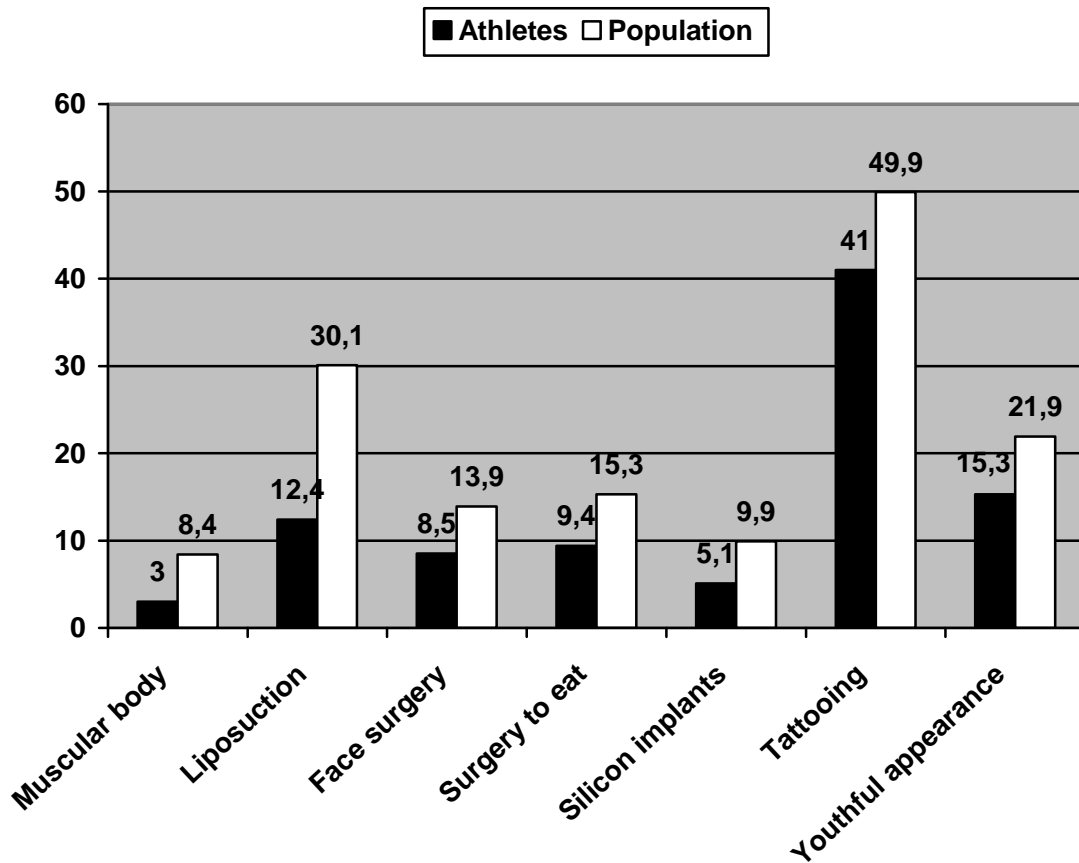


Figure 3. The percentage of respondents that are “willing or “may be willing” to use various types of body modifications. Norwegian elite athletes (EA), n=234, general Population, age group 18-35 (GP) n=428.

The results indicate that both athletes and the general population are more skeptical of body modifications than enhancement of abilities and capacities. Tattooing is most acceptable, with 41.1 percent of the athletes and 49.9 percent of the general population being willing or may be willing to be tattooed. The general population group reports a relative high degree of acceptance towards liposuction, 30.1 percent are willing or maybe willing, whereas the athletes are more skeptical; 12.4 percent are willing to some extent.

People who are willing to use different types of body modifications may be more dissatisfied with their body. We were interested in examining how satisfied or dissatisfied people were with their body. Table 5 presents the answers.

Table 5. 'How satisfied or dissatisfied are you with the appearance of your own body?' Norwegian elite athletes (n=234) and a representative sample of the Norwegian population, age group 18-35 (GP), n=428. Percentages.

	Very satisfied	Quite satisfied	Neither satisfied nor dissatisfied	A little dissatisfied	Very dissatisfied	Do not know/not answered
Elite athletes	17.1	61.5	14.5	5.6	0	0.4
Population	8	47.5	23.2	17.3	3.5	0.5

The results here indicate that few are very dissatisfied with their body. In the general population 55.5 percent reported they were very satisfied or quite satisfied. The athletes are significantly more positive, with 78.6 percent being quite satisfied or very satisfied. In the general population 20.8 percent are dissatisfied to some extent compared to only 5.6 percent among the athletes. The difference between the groups was significant (sig .000).

When we looked at differences between men and women the men were significantly more satisfied with their bodies than the women (sig. .000). 15.1 percent of the men were very satisfied in contrast to only 4.3 percent of the women. A correlation analysis showed that body satisfaction was positively correlated to acceptance of substances that increase physical strength and endurance (.087*), sexual ability (.126*) and empathy (.121*). Satisfaction with one's body appearance was, on the other hand, negatively correlated to willingness to use liposuction (-.223**), surgery to eat (-.113**), and tattooing (-.035*). Even if the correlations are quite weak they show that those who are satisfied with their bodies are more likely to use certain performance enhancements in relation to physical strength, sexual ability and empathy, while dissatisfaction with one's body makes one more likely to use body modifications like liposuction, surgery to control eating and tattooing.

The attitudes to different types of enhancement and body modification techniques may be part of a generalized value system or may alternatively be specific and based on more delimited needs and values. To further explore underlying patterns, we performed a correlation analysis between the various types of enhancements and body modifications. The correlations were performed separately for the two groups in order to see whether the athletes differed from the general population group. The results showed that there were significant correlations between attitudes to different performance enhancements. In fact all correlations were significant at 0.01 level, ranging from 0.364 to 0.716. This means that there exists a basic general attitude to performance enhancements, rather than specialized and specific attitudes varying between life areas. The correlations were in general higher among the elite athletes than in the general population group.

There were significant correlations between all the different body modification techniques, except one, underlining the generality of the attitude towards modifications. There was no significant correlation between reported willingness to take a substance to get a more muscular body, and reported willingness to put silicon implants into one's breast or other body parts. In general the correlations were weaker in this area, leaving more room for variability between types of modification. The correlations varied between 0.046 and 0.640. They were in general higher in the athlete group than in the general population.

To see whether there was a strong link between views on performance enhancement and body modification, we performed a correlation analysis over the two samples combined. The results showed that all the correlations were significant, ranging from .124 to .367. People who hold positive attitudes to performance enhancements are more likely to hold similar attitudes to body modification techniques and vice versa. Those who are negative to enhancements are also negative to body modifications. However the correlations are relatively weak. There are stronger correlations among the different forms of body modification and even more so among the types of enhancement. The results underline that there are generalized dispositions that operate beneath and behind the specific forms and types of enhancement and modification.

Discussion

The first issue we examined concerned attitudes to existing methods of performance enhancement. We found a clear difference in attitude between substances that have ‘mild’ effects and are not forbidden, like nutritional supplements of various types, and substances that have greater effects and are also forbidden, like EPO and anabolic steroids. There have however been debates about the acceptability of nutritional supplements. Even if they are not banned they are ideologically in the twilight zone as they may have some, not yet fully documented, performance-enhancing effects. Furthermore, several products within this category have been found to be contaminated with banned doping substances. Before and during the 2000 Olympic Summer Games in Sydney two Norwegians, a weightlifter and a wrestler, tested positive for a banned substance but protested their innocence by claiming to have used nutritional supplements that were contaminated.³²

It is therefore a little surprising that although elite athletes expressed some skepticism towards nutritional supplements that help the body to recover after training, still 3 out of 4 are positive. Even more surprising is the generally positive attitude to hypoxic rooms. Two thirds of the athletes found such rooms acceptable. This is in contrast to the ambiguous moral status of the technology. The Norwegian ban and WADA skepticism have been opposed by many athletes as it leads to paradoxes and a perceived unfairness since non-Norwegian athletes who train in Norway can live and train in technologically created hypoxic environments, whereas Norwegian athletes are not permitted to do so.

It is also worth noting that there is such a marked difference in reported attitudes towards hypoxic rooms compared to EPO. Both means lead to an increase in red blood cells and improved endurance capacity. However, the anti-doping bodies permit the use of one technology and not the other. This is mainly due to the more invasive character of EPO treatment. EPO, anabolic steroids and amphetamines are accepted by a very small percentage in the population, and there seems to be zero tolerance among athletes. Obviously, strong normative attitudes on rule- and law-conformity shine through, not only among athletes but also in the population.

The zero tolerance reported by athletes is particularly interesting. Athletes are under a double pressure. They are totally dependent upon their performance and performance-enhancing technologies can be crucially effective. On the other hand, some of the most effective substances and technological means are banned, and athletes are often considered role models. One hypothesis is that in this dilemma situation, a zero tolerance attitude is clarifying. Most athletes choose simply to exclude the doping possibility and do not spend energy considering it. Again, it seems as if the strict and clearly articulated public Norwegian anti-doping attitude has a strong regulating effect.³³ Ådne Søndrål, Olympic champion in speed skating and former IOC-member (2002-2006) characterises the Norwegian attitude to doping:

Getting caught in doping is the second-worst crime a Norwegian can commit. In my opinion, only child abuse disgust people more. Doping is a high treason against the nation.³⁴

The reported negative attitude to doping is also reflected in the question of whether anti-doping work should be increased or decreased. The general population obviously holds that not enough is currently being done. Close to 60 percent think that anti-doping work should be increased. This is a high percentage and contrasts with the response of the athletes, of whom 31.6 percent felt that anti-doping work should be increased. The athletes are closer to anti-doping practice and it may be that they feel an increasing uneasiness with the new WADA system, under which they have to report their daily whereabouts and must be ready for out-of-competition testing.³⁵ A hypothesis here would be that athletes feel that the burden of the current anti-doping work is already more than sufficient. Correspondingly 53.8 percent of the athletes think the anti-doping work should be kept at the present level. An additional hypothesis is that the population does not trust the athletes and wants more testing. Indeed, in the mass media, doping scandals attract a great deal of attention and the public impression may be that in some sports, such as professional cycling, doping is common and almost a norm. In a 2006 survey among adolescents and young people, 51 percent answered that drug use is widespread in competitive sport in Norway, a view that is not supported by the number of positive

tests.³⁶ For the period 2002-2006, only 50 (0.35%) out of 14.104 tests carried out by Anti-Doping Norway resulted in sanctions.³⁷

This study focuses not only on the present situation of performance-enhancing and body-modifying means and methods but also looks at possibilities in the future where a wider range of drugs and techniques may be available. We wanted to see how willing both athletes and the general population would be to use such measures even if they incurred some health risks. The first interesting finding is that the ideas of a natural body and natural ways to improve performance do not seem very widely held. A considerable number of people are willing to use enhancements and body modifications. A second finding is that the athletes and the population are more similar in their attitudes than one might have expected. Both groups seem to be more willing to use performance enhancements of various kinds than body modification techniques, suggesting that not only athletes but also other parts of the population are concerned with the ethos of performance.

More specifically, our results indicate that athletes and the general population have similar attitudes in relation to performance enhancements in areas like creative thinking, stress tolerance, and physical strength. Around 20 percent, both among athletes and in the general population reported their willingness to some extent to use enhancements in these areas even if this would lead to a decrease in life expectancy. The general population scored however significantly higher on willingness to use sexual enhancements. On the other hand the athletes were more willing to use emotional enhancements. The most acceptable enhancements in both groups were related to controlling the decrease of performance as a function of aging. Both among athletes and in the general population the highest willingness score was in relation to memory failure, followed by decrease in physical fitness. In both areas the population scored higher than the athletes. The percentage in the general population that was willing to use enhancements to reduce memory failure was as high as 61.6 percent compared to 43.2 among athletes. The fear of Alzheimer's syndrome and other forms of dementia is obviously strong, even among young healthy people. This finding corresponds to findings in international surveys and to a generally higher trust in the potential of new biotechnological means to reduce the negative effects of aging.³⁸

In relation to body modification techniques, the answers differed most in relation to type of modification. Most acceptable to both groups is tattooing with the athletes scoring higher. In the general population liposuction was also accepted by many, with around 30 percent being willing to some degree to use such a technique. This may be related to the growing obesity epidemic that we see also in Norway. And it further reflects the focus on body image and the ideal of the lean and fit body.³⁹ Around 15 percent of the athletes and 22 percent of the general population group would use techniques to keep a youthful appearance. The lowest score in both groups was found in relation to techniques that produce a more muscular body. While it seems that fitness is important for many in the general population it is less important to have a muscular body. This might be an effect of the strong public anti-doping attitudes in sport in which muscle building medicaments are banned. This restrictive attitude might be an expression on the restrictive side of what Grupe calls the 'sportification of popular culture'.⁴⁰ The athletes score low, too, which is probably a result of strong anti-doping attitudes, the selection of persons conforming to sporting body ideals, and training that promotes such a body appearance.

The relatively low scores on willingness to use various techniques like facial surgery, silicon implants and muscular growth could indicate satisfaction with one's body, not only among athletes but in the general population. This is confirmed in the response to the question about how satisfied or dissatisfied people are with the appearance of their own body. It comes as no surprise that among the youthful and fit athletes 17.1 percent claim to be very satisfied and 61.5 percent quite satisfied. In the general population 47.5 percent are quite satisfied and 8 percent very satisfied. However only 3.5 percent are very dissatisfied and 17.3 percent a little dissatisfied. This may account for the fact that the general willingness to use body modification techniques, with the exception of tattooing, is not very strong. As mentioned, there may be higher returns and fewer costs by focusing on improvements in fitness and other performance capacities.

We found that attitudes to both performance enhancement and body modification show a certain generality. This generality is stronger in the enhancement area than in the body modification area. Maybe the quest for enhancement and the progress ethos of

modernity are stronger and more concrete than the quest for body modifications. Furthermore, the correlations were stronger in the athletes' group, which means that they have developed a more generalized and consistent attitude. This may be the result of a certain commonality in life situation, outlook, training and ethos.⁴¹

Concluding Comments

Our findings lead to more general reflections of several kinds. Let us conclude with three points on the background of the social processes described initially in this article; individualization, medicalization and visualization. In working together, these processes put a strong emphasis on the performance and the image of the human body.

Firstly, it is well known that there is a strong focus on the well-trained, slim body in modern Western society. Our study shows that there is some willingness to improve bodily appearance by body modification techniques. However, both among athletes and in the general population, considerably more people are willing to use substances that improve performance in various areas of life. This means that although people are concerned about how they look, but they are even more concerned about how they perform. The focus on performance seems not to be restricted to traditional areas like work and sport, but includes new areas like creativity, stress management, sexuality and emotional involvement. Following Turner one could bring the performance and body modification together into one common perspective: 'We jog, slim and sleep not for their intrinsic enjoyment, but to improve our chance at sex, work and longevity.'⁴²

Secondly, in relation to the broader social and cultural development, the results in many ways confirm that the idea of a natural body is a fading ideal. A growing number of authors support the enhancement ideal. Authors such as Elliott and Miah question the distinction between the natural and the artificial.⁴³ Similarly, the distinction between therapy and enhancement becomes more difficult to uphold. We seem to be moving from biological essentialism towards social constructivism in our views on health and disease. Authors such as Savulescu and Bostrom and also Miah see this as a development full of opportunities and possibilities.⁴⁴ To Miah, the new autonomy and the ideal of self-realization permits athletes to 'legitimately select genetic modifications and other enhancements as a process of self-realization.'⁴⁵ Other authors, such as Murray, view the

development with deep skepticism and argue that it opens the way for bodily alienation and a schizophrenic culture in which discontent with our natural biology becomes the norm and not the exception.⁴⁶

There is a third point, however, that contradicts these tendencies. Elite athletes, who in many ways have most to gain from the use of performance-enhancing means, are those with the strictest attitudes in this area not just in sport but towards performance-enhancing means and body-modification and methods in general. Hence, our findings reject the 0-hypothesis stated initially, that athletes' attitudes to performance-enhancing means and methods simply reflect the attitudes of the general population. No doubt, this is in part due to a strong anti-doping culture and a ban on many performance-enhancing drugs and techniques. Another reason is perhaps the need for clear limits and priorities in a field that is full of ambiguities.

If it is true that society is moving in the direction of more liberal attitudes towards technologies of performance and body modification, elite sport seems to represent a sort of asceticism with hard training and a focus on performance. The anti-doping ethos and the idea of a 'true and clean' sport seem to have had some effect..Perhaps this demonstrates how clear and distinct rules and public attitudes of anti-doping in sport can have an effect in society at large.

Notes

¹ Savulescu and Bostrom, *Enhancement of Human Beings*; Mehlman, *Wundergenes*.

² Hoberman, *Mortal Engines*.

³ WADA, *WADA Code*.

⁴ Black and Pape, *The Ban on Drugs in Sport*; Tamburrini, *The Hand of God?*

⁵ Houlihan, *Dying to Win*; Waddington, *Sport, Health and Drugs*; Lueschen, *Doping in Sport as Deviant Behaviour*

⁶ Hoberman, *Mortal Engines*

⁷ Houlihan, *Dying to Win*

⁸ *ibid*

⁹ *ibid*; Waddington, *Sport, Health and Drugs*.

¹⁰ Mottram, 'Prevalence of drug use in sport'.

¹¹ Waddington, *Sport, health and Drugs*, 170-75.

¹² Heikkala, 'Modernity, Morality and the Logic of Competing'; Bette and Schimank, *Doping im Hochleistungssport*.

¹³ Breivik, 'The doping dilemma'.

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- ¹⁴ Guttman, *From Ritual to Record*; Hoberman, *Mortal Engines*; Heikkala, 'Modernity, Morality and the Logic of Competing'; Møller, 'The anti-doping campaign'.
- ¹⁵ Murphy and Waddington, 'Drugs, sport and ideologies'.
- ¹⁶ de Wachter, 'The symbolism of the healthy body'.
- ¹⁷ Elliott, *Better than Well*.
- ¹⁸ Hoberman, *Testosterone Dreams*.
- ¹⁹ DrugScope, 'New Drug Scope Survey'.
- ²⁰ Giddens, *Modernity and Self-Identity*; Sennett, *The Corrosion of Character*; Berman, *All That is Solid*; Hellevik, *Nordmenn og det gode liv*.
- ²¹ Taylor, *The Ethics of Authenticity*.
- ²² Sault, *Many Mirrors*; Turner, *The Body and Society*.
- ²³ Bordo, 'Feminism, Postmodernism and Gender-Skepticism'.
- ²⁴ Duncan, 'Sports Photographs and Sexual Differences'.
- ²⁵ Grupe, 'The Sport Culture and Sportization of Culture'.
- ²⁶ Cohen et al., 'A league of their own'.
- ²⁷ Bordo, 'Feminism, Postmodernism and Gender-Skepticism'; Fallon et al., *Feminist Perspectives on Eating Disorders*.
- ²⁸ Loland, *Body Image and Physical Activity*.
- ²⁹ Questback is an international company with headquarters in Norway. For more information about QuestBack, see www.questback.no
- ³⁰ Spss 15.0.1
- ³¹ Levine, 'Should "artificial" high hypoxic environments be considered doping?'; Loland and Murray, 'The ethics of the use of technologically constructed high hypoxic environments to enhance performances in sport'.
- ³² Augestad and Bergsgard, *Toppidrettens formel*.
- ³³ Gilberg et al., 'Anti-doping in Sport'.
- ³⁴ Hanstad, 'Hva er det med Norge og doping'?
- ³⁵ Hanstad and Loland, 'Meldeplikt for toppidrettsutøvere'.
- ³⁶ Anti-Doping Norway, *Befolkningens holdning til bruk av doping*.
- ³⁷ Anti-Doping Norway, *Statistikk: Dopingkontroll*.
- ³⁸ Elliott, *Better than Well*.
- ³⁹ Bordo 'Feminism, Postmodernism and Gender-Skepticism'; Johansson, *Den skulpterade kroppen*.
- ⁴⁰ Grupe, 'The Sport Culture and Sportization of Culture'.
- ⁴¹ Gilberg and Breivik, *Hvorfor ble de beste best?*
- ⁴² Ibid., 123.
- ⁴³ Elliott, *Better than Well*; Miah, *Genetically Modified Athletes*.
- ⁴⁴ Savulescu and Bostrom, *Enhancement of Human Beings*; Miah, *Genetically Modified Athletes*.
- ⁴⁵ Miah, *Genetically Modified Athletes*, 135
- ⁴⁶ Murray, 'Enhancement'.

References

Anti-Doping Norway. *Befolkningens holdning til bruk av doping relatert til idrett og trening*. (Attitudes in the Population towards Use of Doping in relation to Sport and Training). Oslo: Anti-Doping Norway. 2006.

Anti-Doping Norway. *Statistikk: Dopingkontroll*. (Statistics: Doping Control. <http://www.antidoping.no/t2.asp?p=70493>. 2008.

Augestad, P. and N.A. Bergsgard. *Toppidrettens formel* (The Formula for Elite Sport). Oslo: Novus forlag. 2007.

Berman, M. *All That is Solid Melts Into Air: The Experience of Modernity*. New York: Penguin Books. 1982.

Bette, K.H. and U. Schimank. *Doping im Hochleistungssport: Anpassung durch Abweichung*. (Doping in elite sport: Adaptation through evasion.) Frankfurt am Main: Suhrkamp. 1995.

Black, T. and A. Pape. 'The Ban on Drugs in Sport: The Solution or the Problem?' *Journal of Sport and Social Issues* 21,1 (1997): 83-92.

Bordo, S. 'Feminism, Postmodernism, and Gender-Scepticism', in L. Nicholson (ed.) *Feminism/Postmodernism*. New York: Routledge.1990.

Breivik, G. 'The doping dilemma. Some game theoretical and philosophical considerations'. *Sportwissenschaft*, 17, 1 (1987): 83-94.

Cohen, J., Collinis, R., Darkes, J., and D. Gwartney. 'A league of their own: demographics, motivations and patterns of use of 1,955 male adult non-medical anabolic steroid users in the United States'. *Journal of the International Society of Sports Nutrition* 4 (2007):12.

de Wachter, F. 'The symbolism of the Healthy Body: A Philosophical Analysis'. *Journal of Philosophy of Sport*, 11 (1984)

DrugScope. 'New DrugScope survey reveals scale of mainstream steroid misuse'. http://www.drugscope.org.uk/news_item.asp?intID=1369. 2006.

Duncan, M.C. 'Sports Photographs and Sexual Differences: Images of Women and Men in the 1984 and 1988 Olympic Games'. *Sociology of Sport Journal*, 7 (1990): 22-43.

Elliott, C. *Better than Well. American Medicine Meets the American Dream*. New York: Norton. 2003.

Fallon, P., Katzman, M.A., and S.C. Wooley, eds. *Feminist Perspectives on Eating Disorders*. New York: The Guilford Press. 1994.

Giddens, A. *Modernity and Self-Identity : Self and Society in the Late Modern Age*. Cambridge: Polity Press. 1991.

Gilberg, R. and G. Breivik. *Hvorfor ble de beste best? Barndom, oppvekst og idrettslig utvikling hos 18 av Norges mestvinnende idrettsutøvere*. (Why did the Best become Best? Childhood, adolescence and athletic development among 18 of the most successful Norwegian athletes). Oslo: Norges idrettshøgskole. 1999.

Gilberg, R., Breivik, G., and S. Loland. 'Anti-doping in Sport: The Norwegian Perspective'. *Sport in Society*, 9 (2006):334-353.

Grupe, O. 'The Sport Culture and Sportization of Culture: Identity, Legitimacy, Sense, and Nonsense of Modern Sport as a Cultural Phenomenon'. In Landy, F., Landry, M. and M. Yerles, eds. *Sport. The Third Millennium*. Proceedings of the International Symposium. Quebec City, Canada. Sainte-Foy: Les presses de l'universite Laval. 1991.

Guttman, A. *From Ritual to Record: the Nature of Modern Sports*. New York: Columbia University Press. 1978.

Hanstad, D. V. 'Hva er det med Norge og doping?' (What is it with Norway and doping?) *Aftenposten*. March 5. 2002.

Hanstad, D. V. and Loland, S. 'Meldeplikt for toppidrettsutøvere: Forsvarlig antidopingarbeid eller uforsvarlig overvåkning?' (Elite level athletes' duty to provide information on their whereabouts: Justifiable anti-doping work or an indefensible surveillance regime?). *Nytt Norsk Tidsskrift*, 24 (2007): 314-322.

Heikkala, J. 'Modernity, Morality, and the Logic of Competing.' *International Review for Sociology of Sport*, 28 (1993): 355-370.

Hellevik, O. *Nordmenn og det gode liv. Norsk Monitor 1985-1995*. (Norwegians and the good life. Norsk Monitor 1985-1995). Oslo: Universitetsforlaget. 1996.

Hoberman, J. M. *Mortal Engines: The Science of Performance and the Dehumanization of Sport*. New York: Free Press. 1992.

Hoberman, J. M. *Testosterone Dreams: Rejuvenation, Aphrodisia, Doping*. Berkeley, Ca: University of California Press. 2005.

Houlihan, B. *Dying to win: Doping in sport and the development of anti-doping policy*. Strasbourg: Council of Europe Publishing. 2002.

Johansson, Th. *Den skulpterade kroppen. Gymkultur, friskvård och estetik*. (The Body Sculptured. Fitness culture, health and aesthetics). Stockholm: Carlssons. 1998.

Levine, B. D. 'Should "artificial" high hypoxic environments be considered doping?' *Scandinavian Journal of Medicine and Science in Sport*, 16 (2006): 297-301.

Lueschen, G. 'Doping in Sport as Deviant Behavior and Social Control' In J. Coakley and E. Dunning, eds. *Handbook of Sport Studies*. Sage. London. 2000.

Loland, N. W. *Body Image and Physical Activity*. Oslo: The Norwegian University of Sport and Physical Education. 1999.

Loland, S. and T.H. Murray. 'The ethics of the use of technologically constructed high-hypoxic environments to enhance performances in sport' *Scandinavian Journal of Medicine and Science in Sport*, 17 (2007):193-195.

Mehlman, M.J. *Wondergenes*. Bloomington: Indiana University Press. 2003.

Miah, A. *Genetically modified Athletes. Biomedical Ethics, Gene Doping and Sport*. London and New York: Routledge. 2004.

Mottram, D. R. 'Prevalence of drug use in sport'. In D.R.Mottram ed.) *Drugs in Sport* (4th edn).London: Routledge. 2005.

Murphy, T.F. and I. Waddington. 'Drugs, sport and ideologies', in E. Dunning and C. Rojek, eds, *Sport and Leisure in the Civilizing Process: Critique and Counter Critique*. Basingstoke and London: Macmillan. 1992.

Murray, T. H. 'Enhancement' in B. Steinbock, ed, *The Oxford Handbook of Bioethics*. Oxford: Oxford University Press. 2007.

Møller, V. 'The anti-doping campaign – farewell to the ideals of modernity?' in Hoberman,J. and V. Møller (eds) *Doping and Public Policy*. Odense: University Press of Southern Denmark. 2004.

Nilsson, S. *Misuse of Anabolic Steroids in Youth: Trends, attitudes and evaluation of an intervention programme*. Göteborg University: Kompendiet AB. 2003.

Sault, N. *Many Mirrors: Body Image and Social Relations*. Piscataway, N.J.:Rutgers University Press. 1994.

Savulescu, J. and Bostom, N. *Enhancement of Human Beings*. Oxford: University Press. 2008.

Sennett, R. *The Corrosion of Character: The Personal Consequences of Work in the New Capitalism*. New York: W.W. Norton. 1998.

SPSS 15.0.1 for Windows. Chicago. Ill: SPSS Inc.2006

Tamburrini, C. *The Hand of God? Essays in the Philosophy of Sport*. In Göteborg: Acta Universitatis Gothoburgensis. 2000.

Taylor, C. *The Ethics of Authenticity*. Cambridge: Harvard University Press. 1991.

Turner, B. S. *The Body and Society, Explorations in Social Theory*. (2nd edn) London: Sage Publications. 1996.

WADA. *WADA Code*. Lausanne: World Anti-Doping Agency. 2003.

Waddington, I. *Sport, Health and Drugs : a Critical Sociological Perspective*. London: E and FN Spon. 2000.