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Aggression questionnaire scores in extremely violent male prisoners, male bodybuilders, and healthy non-violent men

Henning Værøy

Department of Psychiatric Research, Akershus University Hospital, Lørenskog, Norway
Email: heve@ahus.no, h-vaero@online.no, Henning.Vaeroy@Ahus.no

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ABSTRACT

Two aggression questionnaires, the Revised Swedish Version (AQ-RSV) of the Buss-Perry Aggression Questionnaire (AQ) and the shortened and refined version by Bryant and Smith (BS-AQ) were compared. Both questionnaires identified subscore levels of aggression and there were significant differences between the groups. On the AQ-RSV subscales, the violent inmates showed statistically significantly more aggression for Hostility (p = 0.000), Anger (p = 0.000), Physical Aggression (p = 0.000) and Verbal Aggression (p = 0.01) than the healthy (non-violent) men. The bodybuilders, all "on" performance-enhancing substances, scored significantly higher on the Physical Aggression subscale than the healthy men (p = 0.000). Compared to the bodybuilders, the violent inmates scored significantly higher on the Anger (p = 0.02) and Hostility (p = 0.002) subscales. For the BS-AQ, where general variance was higher than for the original AQ, some of the above mentioned relationships were different. The violent inmates still scored significantly higher than the healthy men for Hostility (p = 0.000), Anger (p = 0.006) and Physical Aggression (p = 0.000), but not for Verbal Aggression. The inmates scored significantly higher than the bodybuilders for Anger (p = 0.006) and Verbal Aggression (p = 0.006), and the bodybuilders scored higher than the healthy men on the Physical Aggression (p = 0.002) subscale only. These and other more complex relationships are discussed in the light of previous findings. Thus the BS-AQ resulted in more sharply defined relationships and, at the same time, showed some important differences between the groups studied. Verbal Aggression does not seem to distinguish violent inmates from healthy men. Angry bodybuilders tend to express their aggression through Physical Aggression.

Keywords: Aggression; Violence, Criminals; Bodybuilders

1. INTRODUCTION

The long history of human violence is difficult—if not impossible—to explain with contemporary psychological theories. Even before television, toy guns, steroids, narcotics, alcohol and violent computer games influenced our daily lives, men killed each other. In the most ancient tribes, up to 25% of the male population were killed either by local or neighbouring tribe members [1]. Today, men commit most of the world's violent acts reported to the police, and men are consequently overrepresented (85% - 90%) in prisons [2].

One of the key motives for extreme male—male aggression in the evolution of aggression appears to be the defence of status and honour. In addition, humans have an evolutionary history of sex differences as a contributory explanatory factor in human aggression [2]. A man's sexual jealousy directed towards another man's covetousness may also trigger extreme aggression and homicide [3,4]. A significant association between direct, mainly Physical Aggression and greater height, weight and strength, has also been described [5].

As long as 25 years ago, side effects from athletes' use of anabolic-androgenic steroids (AAS) were recognised as a problem and were found to be increasing, also among non-athletes [6]. Since then, a large number of papers have been published on the adverse effects using AAS [7]. Aggression has been linked to bodybuilding [7], and some authors describe the perception of increased aggression by sports competitors as a desired effect [7,8]. Some studies of health club athletes have shown that 90% of the users of AAS report episodes of over-aggression and violent behaviour [9], whereas other studies do not support such associations [10,11]. After a 25-week study where 600 mg testosterone cypionate per week were given to the study subjects, no participants reported actual violence, but several described instances of uncharacteristic aggressiveness [12].

A more recent paper concluded that high doses of AAS

may elicit neuropsychiatric symptoms among a minority of users [13]. However, subgroups of steroid abusers may have known psychiatric pre-morbidities that are likely to introduce bias into the suggested causal relationship between anabolic steroid abuse and neuropsychiatric effects. Studies have also shown a correlation between mental side effects and the severity of steroid abuse [14]. The neural systems underlying the aggression induced by AAS appear to overlap with the brain circuits responsible for the regulation of aggression by endogenous androgens such as vasopressin [15].

Several studies have pointed out that stable personality traits influence aggressive and delinquent behaviour [16]. A meta-analysis [17] found that trait aggressiveness and trait irritability influenced aggressive behaviour under both neutral and provocation conditions. Anger and Type A personality influenced aggressive behaviour only under provocation [18]. People with Antisocial Personality Disorder (ASPD) show greater increases in aggressive behaviour after consuming alcohol than people without ASPD [19], and there is a relationship between borderline personality (BP) traits and aggression, especially the reactive form [20].

The self-rating Buss-Perry Aggression Questionnaire (AQ) [21] is considered by many to be the gold standard for measuring aggression. It has been criticized, for example, for contamination of item and sum scores with social desirability responding (SDR) [22,23]. Despite the fact that the confounding effect of SDR has been found to be quite substantial across all items, it had only a minimal distorting effect when evaluating the extent of bias [22].

Factor analysis showed that the Buss and Durkee Hostility Inventory (BDHI) [24] covers four components of aggression: Verbal and Physical Aggression, Anger, and Hostility. There is a considerable overlap between the BDHI [24] and the AQ [21] which was developed later. Whereas the BDHI has been used, for example, to distinguish between violent and non-violent men and between delinquent and non-delinquent adolescents, the AQ [21] has been widely used to assess the subtraits of aggression and the patterns of their relationships with other variables.

A translated and validated Revised Swedish Version (RSV), based on the validation standard of the AQ [21] now exists (AQ-RSV) [25] for clinical use and research in the general population.

Bryant and Smith [26] introduced a 12-question refined measurement model (BS-AQ) of the original AQ [21] since the latter has low common variance and because of a confusing overlap between what the subscales actually measure. Bryant and Smith discourage basing the analysis of questionnaire responses entirely on the 29-item total scores because important distinctions may be masked.

This led us to investigate whether the AQ-RSV [25] and the BS-AQ [26] can distinguish between different levels of aggression in three selected groups of men: extremely violent prisoners, bodybuilders, and healthy men.

2. MATERIALS AND METHODS

The Norwegian Regional Ethics Committee approved the study (ID: 2010/792).

2.1. Study Subjects

2.1.1. Bodybuilders

13 bodybuilders, all men, were recruited from a gym in a suburban area of Oslo. They were actually recruited to participate in a larger study which also involved blood sampling. They were explained the aim of this study and agreed to participate and to declare their use of performance-enhancing substances in the way they found best. **Table 1** shows the drugs and doses declared by the participants.

The mean age of the body builders was 41.6 ± 11.3 years, and the median age was 46 years. Screening for psychiatric illness showed none at the time of data collection.

2.1.2. Inmates

16 violent male inmates were recruited from a high security prison outside Oslo. They were actually recruited to participate in a larger study which also involved blood sampling. When blood sampling was mentioned when describing the study, some inmates were reluctant to participate, resulting in a low number of participants. The inmates were all serving longterm sentences, the majority in preventive detention. In Norway, such sentences are not associated with a specific term. The imposition of preventive detention indicates that the court considers the defendant at high risk for reoffending, and therefore as an imminent threat to society. According to Norwegian law, after having served a minimum term not exceeding 10 years, prisoners in preventive detention may ask the court to reconsider their case.

Table 2 shows the inmates' ages and crime categories.

No serious mental illness was found when screening for psychiatric disorders. Applying the Hospital Anxiety and Depression Scale (HADS) with a cut-off set at 8 points, 5 of 15 inmates exceeded the cut-off for anxiety and 1 for depression. One questionnaire was not completed. The category sex-related violence included brutal violence, where the violent crime may have included rape, molesting or grievous bodily harm. All the inmates completed the AQ-RSV sitting alone in a room in the visiting area outside their departments in the prison.

Table 1. Drugs and doses taken by bodybuilders (BB) (Where variations were declared, the highest dosage was chosen).

	BB1	BB2	BB3	BB4	BB5	BB6	BB7	BB8	BB9	BB10	BB11	BB12	BB13
Trenbolone acetate									100 mg/ day				
Trenbolone enanthate									200 mg/day		100 mg/day	100 mg/2days	
Deca Durabolin	100 mg/4days	200 mg/4days			200 mg/4days		200 mg/day	500 mg/week					500 mg/ 2weeks
Growth hormone	1.6 mg/day		4 IU*/day			5 IU/day			10 IU/1day		12 IU/2days		4 IU/day
Boldenone undecylenate									200 mg/ 4 days		100 mg/ day		
Testosterone enanthate	250 mg/4days	250 mg/4days		250 mg/4days	250 mg/ 2weeks	100 mg/2days	250 mg/4days		250 mg/2days	500 mg/2days	250 mg/day	250 mg/ 2days	
Testosterone undecanoate						1 gram/ month							1 gram/ 2weeks
Testosterone cypionate			200 mg/6days										
Tamoxifen									100 mg/day				
Insulin (IU)											20/2days		
Clenbutirol									50 mg/day				
Proviron									100 mg/day				
Stanozolol									50 mg/4days				
IgF/HgF (Russians)							3 units/day						

*IU = International Units.

Table 2. Inmates' ages and crime categories.

Inmates	Age (years)	Murder or attempted murder	Violence & Assault	Sex-related violence*
1	36	X		
2	46		X	
3	51	X		
4	44	X		
5	70	X		
6	47			X
7	32	X		
8	50	X		
9	51	X		
10	36	X		
11	31			X
12	22	X		
13	53			X
14	27			X
15	46	X		
16	29	X		
Total 16	Mean: 41.9 ± 11.9 Median: 45	$n = 11$	$n = 1$	$n = 4$

*Excluding paedophilia.

2.1.3. Non-Violent and Non-Steroid Abusing Healthy Men

The 21 control subjects were all men with no criminal record of aggression. They did not have any drug abuse problems and they were all working without restriction in society. In this paper they will be referred to as healthy men. Some were fish market workers, some hospital workers, and some held academic positions. They were actually recruited to participate in a larger study which also involved blood sampling. The mean age of the healthy men was 41.8 ± 10.4 years and the median age was 42 years. Screening for psychiatric illness showed no illness at the time of the data collection.

2.2. The Aggression Questionnaire—Revised Swedish Version (AQ-RSV)

The Swedish version of the AQ [25] was developed for research into clinical aggression based on the US American version of the AQ [21]. For validation, the test was mailed to 781 randomly selected individuals aged 20 - 40 years. Of these, 497 tests were evaluable (64%). The results with the American and the Swedish versions were comparable for the correlations between the four aggression subscales and alpha coefficients, indicating internal

consistency.

The Swedish and Norwegian cultures and languages are very close, which means that the AQ-RSV can be directly applied in a Norwegian population. The AQ-RSV operates with cut-off values that classify the test subjects into three categories. "Normal" scores are between 0 and 39 points, "Elevated" scores between 40 and 68 points, and "Pronounced" scores between 69 and 87 points.

2.3. The Bryant and Smith Shortened and Refined Aggression Questionnaire (BS-AQ) [26]

For comparison with this scale [26], the 12 corresponding questions to those on the BS-AQ were identified on the AQ-RSV and the respective scores were selected for the analyses.

2.4. Statistics

SPSS for Windows, version 15.0.1 (SPSS Inc. SPSS 15.0.1-November 2006. SPSS for Windows, Chicago, SPSS Inc.) was used for calculating ANOVA and the *t*-test for independent samples. A p value ≤ 0.05 was considered statistically significant.

3. RESULTS

3.1. Aggression

3.1.1. Total Aggression

The AQ-RSV total aggression score for the inmates amounted to a mean of 40.4 ± 16.1. The corresponding values for the healthy men were 16.9 ± 7.3 and for the bodybuilders 25.5 ± 12.4. Both scores were significantly lower than in the inmates ($p = 0.000$ and $p = 0.01$ respectively). The difference between the mean scores in the bodybuilders and the healthy men was also significant ($p = 0.01$).

Applying the cut-off suggested by the authors of the AQ-RSV, *i.e.* normal between 0 and 39, all the total scores in the bodybuilders were normal except one "elevated", and none of the healthy men had total AQ-RSV score higher than 39. Only 7 of the inmates scored higher than 39, leaving 9 within the normal range.

3.1.2. Aggression Subgroups

In **Table 3** the total scores for the three groups are broken down into the 4 AQ-RSV subgroups of aggression.

Table 3 shows that a statistically significant difference in aggression was found only for the Physical Aggression subscale when comparing the bodybuilders to the healthy men ([c]). It is also evident that the inmates' scores ([b]) reflected more aggression among the violent inmates than among the bodybuilders for the item Anger, and this was even more marked for the item Hostility. In general, the violent inmates scored significantly higher in all subgroups compared to the healthy men ([a]).

Table 3. AQ-RSV subgroups (mean ± SD) score values and significance levels (ANOVA).

Groups	Hostility	Anger	Physical Aggression	Verbal Aggression
Violent inmates	$10.1 \pm 4.7^{a,b}$	$9.1 \pm 5.1^{a,b}$	$14.2 \pm 6.7^{a,b}$	$6.9 \pm 2.5^{a,b}$
Bodybuilders	$4.3 \pm 4.4^{b,c}$	$5.2 \pm 3.7^{b,c}$	$10.0 \pm 5.1^{b,c}$	$5.7 \pm 2.2^{b,c}$
Healthy men	$3.7 \pm 2.6^{a,c}$	$4.2 \pm 1.9^{a,c}$	$3.6 \pm 3.7^{a,c}$	$5.2 \pm 1.5^{a,c}$
***p*-values**	$^{a}p = 0.000$ $^{b}p = 0.002$ $^{c}p = 0.58$	$^{a}p = 0.000$ $^{b}p = 0.02$ $^{c}p = 0.30$	$^{a}p = 0.000$ $^{b}p = 0.07$ $^{c}p = 0.000$	$^{a}p = 0.01$ $^{b}p = 0.20$ $^{c}p = 0.42$

[a]Violent inmates vs healthy men; [b]Violent inmates vs bodybuilders; [c]Bodybuilders vs healthy men.

Table 4 shows the results of selecting only the questions suggested by Bryant and Smith [26] and using the t-test for independent samples.

4. DISCUSSION

The revised Swedish version of the Buss-Perry Aggression Questionnaire (AQ-RSV) [25] distinguished between a group of violent inmates and two other groups based on the subscale scores (**Table 3**). These results overlapped to some extent with those obtained after the application of the BS-AQ [26]. Some relationships were less marked and others were more marked.

Bodybuilders on active self-treatment (**Table 2**) scored significantly higher than the healthy men on the Physical Aggression subscale. This remained the only statistically significant difference between bodybuilders and healthy men when applying the BS-AQ [26]. On the other subscales, the differences in scores between the bodybuilders and the healthy men were not significant in the two different versions of the AQ.

The violent inmates scored significantly higher than the healthy men on the AQ-RSV [25] subscales in general. Table III shows that the violent inmates scored significantly higher ($p = 0.02$) than the bodybuilders on both the Anger subscale and the Hostility subscale ($p = 0.002$).

When applying the BS-AQ [26], a greater degree of statistical significance between the inmates and the bodybuilders was seen for the Anger subscale ($p = 0.006$) and the difference for the Hostility subscale became non-significant. Bryant and Smith's refinement of the AQ included the removal of items reflecting direct endorsement of aggression. Of the original Anger subscale questions [21], 3 were kept in the BS-AQ [26], *i.e.* those that express the most spontaneity and impulsivity: "I flare up quickly but get over it quickly", "Sometimes I fly off the

Table 4. BS-AQ subscale aggression scores—*t*-test for independent samples ($p \leq 0.05$).

Study groups	n	Hostility	Anger	Physical Aggression	Verbal Aggression
Inmates vs Healthy men	16	$p = 0.000$	$p = 0.006^*$	$p = 0.000$	ns*
Inmates vs Bodybuilders	13	ns*	$p = 0.006^*$	ns	$p = 0.006^*$
Bodybuilders vs Healthy men	21	ns	ns	$p = 0.002^*$	ns

*Indicates a different level of significance from **Table 3**; ns = not significant.

handle for no good reason" and "I have trouble controlling my temper". In the context of the present study, a possible extrapolation could be that the positive scores on the BS-AQ [26] reflect a higher degree of impulsivity in the inmates' than in the bodybuilders and the healthy men (**Table 4**).

The reason why the statistical significance of the results on the AQ-RSV Hostility subscale was lost when applying the BS-AQ [26] was most likely linked to the exclusion of the 5 questions with a wording suggesting some degree of paranoia. In their paper, Bryant and Smith [26] explain that omitting the questions containing jealousy, paranoia and suspiciousness from Hostility distinguishes it clearly from Anger. At the same time, the Hostility subscale better reflects the cognitive dimension featuring negative feelings. A practical consequence of this argumentation is that the violent inmates in the present study seemed to have more cognitive negative feelings than the bodybuilders and the healthy men (**Table 4**).

Verbal Aggression is another subscale where the statistically significant difference between the inmates and the bodybuilders was greater when comparing the BS-AQ and the AQ-RSV scores. In the AQ-RSV, the p-value was 0.20 (not significant) and increased to 0.006 in the BS-AQ. Bryant and Smith [26] noted that despite correlations between each of the other AQ factors, Verbal Aggression showed no discriminant validity in either the original version [21] or in their refined version (BS-AQ). The large difference between the significance level for Verbal Aggression of $p = 0.2$ on the AQ-RSV and $p = 0.006$ on the BS-AQ indicates a contribution of factors with a strong influence, and that these factors may not have been identified by Bryant and Smith in their model [26]. A clear answer is not evident, but some tentative explanations may be found within different study group characteristics.

The inmates did not score significantly higher than the healthy men on the Verbal Aggression subscale (**Table 4**). Thus, what seems to contribute to the statistical difference between the inmates and the bodybuilders is most likely found among the bodybuilders. It may be farfetched psychologically, but perhaps the 3 questions retained by Bryant and Smith elicit some sort of implicit "hyper-vigilance" or underlying "jumpiness"? And, might this hypothetical "state of alertness" cause precocious responses in the form of spontaneous and perhaps impulsive behaviour? If the answer is yes, the same behaviour is retrospectively and individually recognized and scored when the following statements are presented: "I often find myself disagreeing with people"; "I can't help getting into arguments when people disagree with me" and "My friends say that I'm somewhat argumentative".

Studies on the use of steroids and athletes' startle response are also relevant to consult since, although not clearly demonstrated, it cannot be excluded that both factors may contribute to the bodybuilders' scores on Verbal Aggression. Studies have shown that the use of testosterone seems to reduce the fear-potentiated startle response in humans [27] and, following exposure to imagery of personal anger scenes, normal study subjects showed greater startle activity [28].

Regardless of the questionnaire, in this study, the bodybuilders' subscale scores on the Physical Aggression subscale were the only statistically significant scores that distinguished them from the subscale scores in the group of healthy men. The bodybuilders' scores on the other aggression subscales did not differ significantly from those in the healthy men. How strong an influence the bodybuilders' use of performance-enhancing drugs may have had on their subscale scores is not possible to ascertain. It is unlikely that the use of such drugs alone would be responsible for the elevated Physical Aggression scores among the users.

Of special interest is why Physical Aggression stands out. One plausible answer may be found in the athletes' personalities. Studies of personality characteristics among bodybuilders have revealed that traits of obsession, perfectionism, anhedonia and narcissism are more frequently found than in the general population [29]. Other studies have emphasized that the desire to become more muscular in association with the feeling of enhanced confidence [30] and the desire to gain strength [31] seems to be important for bodybuilders. From a psychiatric point of view, these same desires are also important ingredients for the nurturing of established narcissism. Perhaps the psychological perception of body image and size is also linked to the expression of aggressiveness in some bodybuilders. The dedication and sacrifice needed to become successful is perhaps common for all athletes who repeatedly, and despite the cost, drive themselves beyond what most people associate with being safe. Studies have shown that narcissism correlated with Physical Aggression in men [32] and that there are high levels of narcissism among male bodybuilders [33].

Some of Bryant and Smith's critical comments [26] on

the Buss-Perry AQ [21] were based on the common variance between the four original AQ scales being only 80%. In the construction of the BS-AQ, items with low loadings or multiple loadings were omitted based on principal components [26]. Likewise, items with reverse-scored wording were removed. This resulted in a 12-item, 4-factor measurement model with fewer than half as many items (BS-AQ) as in the original AQ [25]. According to the authors, the gain was a new, refined, psychometrically superior scale [26]. They further argue that it is more reasonable to examine the four separate subtraits than rely only on a pooled total score, since an AQ total score might obscure differences that exist for individual factors [26]. Consequently, Bryant and Smith strongly recommended not useing only the 29-item total score in quantifying responses to the AQ [21]. Instead, examining the four separate subtraits is more reasonable, both conceptually and statistically [26].

If one hypothetically adopts the AQ-RSV as the gold standard for aggressive measures, all but one of the bodybuilders' total scores was lower than the cut-off of 39 points set for normal, non-aggressive healthy males [25]. The fact that 9 of the 16 violent inmates also had normal AQ-RSV total scores did not comply with the criminal acts for which they were serving their sentences. Lowering the "normal" cut off score for total aggression to 26 points would mean that all violent inmates had "elevated" total scores. A total aggression cut off score of 26 points would still include 20 of the 21 healthy men. With the same reduced cut-off, however, 6 of the bodybuilders would be classified as having "elevated total" aggression scores. In their paper, the authors of the AQ-RSV [25] explain that one of their aims was "to present psychometric data supporting its reliability and validity in the general Swedish population". In their original paper, Buss and Perry [21] stress the limitations of the results since their first study population were college students and the second population were a group of college men. A common denominator therefore seems to be the need for an instrument where extrapolations from population sub-groups can be made without losing statistical power.

It is a known problem that prison inmates are difficult to recruit [34-36], at least in Norway. One of the problems with the present study was the low number of participants. Although this was the case, those who participated were willing to share information about their lives in prison and abuse of often illegal medications. A minor problem is that our study subjects were slightly older than those in some of the studies using scales derived from the original AQ [21], but this difference was minimal and has consequently not been given any further attention in this study.

Comparing the inmates' AQ-RSV total aggression scores to the total scores from the bodybuilders and the healthy men, it was found that the statistical significance of the differences was high. Likewise, when comparing the total aggression scores from the bodybuilders to the scores from the healthy men, there was clear statistical significance. This study has also shown that focusing on the subscale scores from both scales [25,26] provides more and statistically sounder information about the differences between the groups studied. The AQ-RSV and the BS-AQ subscale scores confirm that the violent inmates are more angry and hostile than both the bodybuilders and the healthy men. It also seems that whenever the bodybuilders show aggressiveness, physical aggression tends to be involved, and that their answers to questions associated with Verbal Aggression are different; answers for which the explanation may be traced back to personality characteristics.

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REFERENCES

[1] Chagnon, N. (1988) Life histories, blood revenge, and warfare in a tribal population. *Science*, **239**, 985-999. doi:10.1126/science.239.4843.985

[2] Lindenfors, P. and Tullberg, B.S. (2011) Evolutionary aspects of aggression: The importance of sexual selection. *Advances in Genetics*, **75**, 7-22. doi:10.1016/B978-0-12-380858-5.00009-5

[3] Daly, M. and Wilson, M. (1988) Homicide. Aldine de Gruyter, New York.

[4] Buss, D.M. and Shackelford, T.K. (1997) Human aggression in evolutionary psychological perspective. *Clinical psychology Review*, **17**, 605-619. doi:10.1016/S0272-7358(97)00037-8

[5] Archer, J. and Thanzami, V. (2007) The relation between physical aggression, size and strength, among a sample of young Indian men. *Personality and Individual Differences*, **43**, 627-633. doi:10.1016/j.paid.2007.01.005

[6] Wagner, J.C. (1989) Abuse of drugs used to enhance athletic performance. *American Journal of Hospital Pharmacy*, **46**, 2059-2067.

[7] Maravelias, C., Stefanidou, D.M. and Spiliopoulou, C. (2005) Adverse effects of AAS in athletes: A constant threat. *Toxicology Letters*, **158**, 167-175. doi:10.1016/j.toxlet.2005.06.005

[8] Hough, D.O. (1990) Anabolic steroids and ergogenic aids. *American Family Physician*, **41**, 1157-1164.

[9] Tamir, E., Ner, Y.Z., Dayan, Y. and Tamir, D. (2004) Knowledge and attitude regarding use of anabolic steroids among youth exercising in fitness centers. *Harefuah*,

143, 348-352.

[10] Bhasin, S., Storer, T., Berman, N., Callegari, C., Clevenger, B., Phillips, J., Bunnell, T.J., Tricker, R. and Shirazi, A. (1996) The effects of supraphysiologic doses of testosterone on muscle size and strength in normal men. *The New England Journal of Medicine*, **335**, 1-7. doi:10.1056/NEJM199607043350101

[11] Yates, W.R., Perry, P.J., MacIndoe, J., Holman, T. and Ellingrod, V.L. (1999) Psychosexual effects of three doses of testosterone cycling in normal men. *Biological Psychiatry*, **45**, 254-260. doi:10.1016/S0006-3223(98)00028-6

[12] Pope Jr., H.G., Kouri, E.M. and Hudson, J.I. (2000) Effects of supraphysiologic doses of testosterone on mood and aggression in normal men. *Archives of General Psychiatry*, **57**, 133-140. doi:10.1001/archpsyc.57.2.133

[13] van Amsterdam, J., Opperhuizen, A. and Hartgens, F. (2010) Adverse health effects of anabolic-androgenic steroids. *Regulatory Toxicology and Pharmacology*, **57**, 117-123. doi:10.1016/j.yrtph.2010.02.001

[14] Pagonis, T.A., Angelooulos, N.V., Koukoulis, G.N. and Hadjichristodoulou, C.S. (2006) Psychiatric side effects induced by supraphysiological doses of combinations of anabolic steroids correlate to the severity of abuse. *European Psychiatry*, **21**, 551-562. doi:10.1016/j.eurpsy.2005.09.001

[15] Clark, A.S. and Henderson, L.P. (2003) Behavioral and physiological responses to anabolic-androgenic steroids. *Neuroscience and Behavioural Reviews*, **27**, 413-436. doi:10.1016/S0149-7634(03)00064-2

[16] Anderson, C.A. and Bushman, B.J. (2002) Human aggression. *Annual Review of Psychology*, **53**, 27-51. doi:10.1146/annurev.psych.53.100901.135231

[17] White, H.R., Bates, M.E. and Buyske, S. (2001) Adolescence-limited versus persistent delinquency: Extebding Moffitt's hypothesis into adulthood. *Journal of Abnormal Psychology*, **110**, 600-609. doi:10.1037/0021-843X.110.4.600

[18] Bettencourt, B.A., Talley, A., Benjamin, A.J. and Valentine. J. (2006) Personality and Aggressive behavior under provoking and neutral conditions: A meta-analytic review. *Psychological Bulletin*, **132**, 751-777. doi:10.1037/0033-2909.132.5.751

[19] Moeller, F.G. and Dougherty D.M. (2001) Antisocial personality disorder, alcohol and aggression. *Alcohol Research and Health*, **25**, 5-11.

[20] Gardner, K.J., Archer, J. and Jackson, S. (2012) Does maladaptive coping mediate the relationship between borderline personality traits and reactive and proactive depression? *Aggressive Behavior*, **38**, 403-413. doi:10.1002/ab.21437

[21] Buss, A.H. and Perry, M. (1992) The aggression questionnaire. *Journal of Personality and Social Psychiatry*, **63**, 452-459.

[22] Becker, G. (2007) The Buss-perry aggression questionnaire: Some unfinished business. *Journal of Research in Personality*, **41**, 434-452. doi:10.1016/j.jrp.2006.05.004

[23] Harris, J.A. (1997) A further evaluation of the aggression questionnaire: Issues of validity and reliability. *Behaviour Research and Therapy*, **35**, 1047-1053. doi:10.1016/S0005-7967(97)00064-8

[24] Buss, A.H. and Durkee, A. (1957) An inventory for assessing different kinds of hostility. *Journal of Consulting Psychology*, **21**, 34-349. doi:10.1037/h0046900

[25] Prochazka, H. and Ågren, H. (2001) Aggression in the general Swedish population, measured with a new self-rating inventory: The Aggression Questionnaire—Revised Swedish version (AQ-RSV). *Nordic Journal of Psychiatry*, **55**, 17-23. doi:10.1080/080394801750093661

[26] Bryant, F.B. and Smith, B.D. (2001) Refining the architecture of aggression: A measurement model for the Buss-Perry Aggression Questionnaire. *Journal of Research in Personality*, **35**, 138-167. doi:10.1006/jrpe.2000.2302

[27] Hermans, E.J., Putman, P., Baas, J.M., Koppeschar, H.P. and van Honk, J. (2006) A single administration of testosterone reduces fear-potentiated startle in humans. *Biological Psychiatry*, **59**, 872-874. doi:10.1016/j.biopsych.2005.11.015

[28] Miller, M.W., Patrick, C.J. and Levenstone, G.K. (2002) Affective imagery and the startle response: Probing mechanisms of modulation during pleasant scenes, personal experiences, and discrete negative emotions. *Psychophysiology*, **39**, 519-529. doi:10.1017/S0048577202394095

[29] Davis, C. and Scott-Robertson, L. (2000) A psychological comparison of females with anorexia nervosa and competitive male bodybuilders, body shape ideals in the extreme. *Eating Behaviors*, **1**, 33-46. doi:10.1016/S1471-0153(00)00007-6

[30] Wright, S., Grogan, S. and Hunter, G. (2000) Motivations for anabolic steroid use among bodybuilders. *Journal of Health Psychology*, **5**, 566-571. doi:10.1177/135910530000500413

[31] Tricker, R., O'Neil, M.R. and Cook, D. (1989) The incidence of anabolic steroid use among competitive bodybuilders. *Journal of Drug Education*, **19**, 313-325. doi:10.2190/EGT5-4YWD-QX15-FLKK

[32] Ryan, K.M., Weikel, K. and Sprechini, G. (2008) Gender differences in narcissism and courtship violence in dating couples. *Sex Roles*, **58**, 802-813. doi:10.1007/s11199-008-9403-9

[33] Rubinstein, G. (2003) Macho Man: Narcissism, homophobia, agency, communion, and authoritarianism—A comparative study among Israeli bodybuilders and a control group. *Psychology of Men & Masculinity*, **4**, 100-110. doi:10.1037/1524-9220.4.2.100

[34] Værøy, H., Andresen, K. and Mowinkel, P. (2011) The likelyhood of successful crime prevention: Norwegian detainees on preventive detention views on programmes and services organized and provided by the criminal justice system. *Psychiatry, Psychology and Law*, **18**, 240-247. doi:10.1080/13218719.2010.501780

[35] Værøy, H. (2011) Depression, anxiety and history of substance abuse among Norwegian inmates on preventive detention: Reasons to worry? *BMC Psychiatry*, **11**, 40.

doi:10.1186/1471-244X-11-40

[36] Værøy, H. (2012) Diagnostic procedures and classification of antisocial behavior among Norwegian inmates in preventive detention. *Open Journal of Psychiatry*, **2**, 207-210. doi:10.4236/ojpsych.2012.23027

