

AGGRESSIVENESS IN SPORT – MEASUREMENT METHOD

(Original scientific paper)

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Abstract

Aggression is a process, and aggressiveness is a feature of character. This article contains comprehensive data about Aggressiveness in Sport Questionnaire, that comprises three scales: 1) „Go-ahead” i.e. persistently pursue a goal regardless of appearing obstacles 2) „Tripping someone up” - person characterized by this kind of aggressiveness has no scruples, is interested only in his or her own business and considers as normal trampling over people to achieve his or her goals, 3) “Assertiveness” – person characterized by this kind of aggressiveness is courageous in his or her actions and expression of opinions in spite of potential negative consequences he or she incurred. The research group consisted of sportsmen practicing 1) individual non contact sports, 2) combat sports and, 3) team sports. In this article the Aggressiveness in Sport Questionnaire content, application and method of computing scores are presented.

Keywords: *risk, self-reliance, green light, aggressiveness, sports Questionnaire, individual sports, sports wrestling, team sports, sports psychology, factor analysis, reliability*

INTRODUCTION

Aggression and aggressiveness - these terms sound similarly, however their significance is not the same. Aggression is most frequently defined as a process, i.e. the course of successive linkages, cause-specific changes, constituting subsequent stages, phases of an individual's actions. Whereas aggression is understood as a personality trait that manifests itself in the tendency to express frequent aggressive reactions.

Aggression is a notorious phenomenon, but it is not unequivocally defined in the psychology science (Aronson 1999; Aronson, Wilson, Akert 2012; Bandura 1983; Buss 1961; Deffenbacher 2008; Krahe 2001; Loeber, Hay 1997, Nelson 2005; Niehoff 1999; Robertson, Daffern, Bucks 2012).

Biological ways of explaining aggression include among others: 1) Ethological point of view: aggression as an internal energy (Lorenz, 1974) Socio-biological point of view: aggression as a product of evolution (Archer 1995; Buss and Shakelford, 1997; Daly and Wilson, 1994). Psychological ways of explaining aggression take into account among others: 1) Psychoanalytical explications: aggression as a destructive instinct (Freud 1920), 2) the Frustration-Aggression hypothesis: aggression as an impulse directed at achieving some goal (Dollard, Doob, Miller, Mowrer, Sears, 1939). Cognitive neo association theory: the role of negative affect (Berkowitz, 1997), Excitation-transfer theory: anger and the attribution of excitement (Zillmann, 1979),

Social-cognitive approach: aggressive scripts and social information processing (Huesmann, 1988). Aggression learning theory: the role of reinforcement and imitation (Bandura, 1983), Social interaction model: aggression as coercive social influence (Tedeschi, & Felson, 1994).

The most frequently accepted aggression definition considers this phenomenon as a behaviour aimed at inflicting pain to another human being who wants avoid this pain. “I would define an aggression act as behaviour intended to inflict damage or pain” (Aronson, Wilson, & Akert, 2012); Buss 1961) introduced the notion of aggression as a personality variable (trait and state) shaped by habits. He defines aggressiveness as the habit of attacking others, as a relatively stable individual's characteristic consisting in frequent and inadequate to the stimulus highly intensive reactions.

With reference to sport, Husman & Silva (1984) regard aggressiveness as bold and energetic pursuit of a goal. These Authors distinguish three types of aggression (aggressiveness) in sport: 1) proactive assertiveness, 2) instrumental aggression, 3) reactive aggression. In turn, Thirer (1993) believes that aggression in sport appears as:

1) non-destructive aggression, identified with assertiveness. This aggression type is characterized by self-defence and attitude toward goal attainment.

2) angry aggression associated with destructiveness, anger, harming, hate, revenge and rage.

It is assumed that aggression level is determined

by four factors (Makarowski, Peplińska, & Nowopolski, 2010; Maxwell, Visek, & Moores 2009; Russell 2008; Rowe 1998):

1) the incidence of antecedent factors triggering and preceding aggression (attack, frustration, unpleasant and annoying stimuli)

2) rewarding of aggressive reactions, this prize may also consist in the decrease of emotional tension after an act of aggression or in the elimination of a frustration source,

3) social reinforcements (for example approval of a group, frequent provocations to aggression),

4) innate biological predispositions, especially temperament. Archer (1988) proposed a classification based on functions of different types of behaviour:

Utilitarian aggression (its goal is the problem resolution):

1) Defensive aggression – the problem to solve is the threat of physical attack,

2) Parental aggression – the problem to solve is the threat to offspring,

3) Rivalry aggression – the problem to solve is the appropriate resources distribution.

Defensive aggression serves the purpose of fighting off the threats. For example death or pain can constitute these threats. Parental aggression is in a way a form of defensive aggression because it is aimed at averting the threat that endangers offspring. Rivalry aggression is aimed at fighting off the threats which could diminish one's resources, e.g. food, good mood, social position.

Similarly, it may be supposed that dynamic, active and "go-ahead" people achieve success in sport (Moesch, 2010). These people are characterized by expansiveness, i.e. the desire to catch up with the best and the strongest ones, as well as by setting themselves ambitious goals to achieve greater advantages, greater resources. "Go-ahead" is linked not only to aggression but also to the risk (Brewer, Howarth, 2012; Castanier, Le Scanff, 2010). The opposite of a "go-ahead" person is a passive one. From this perspective the group of sportsmen may be divided into: submissive, aggressive and assertive ones. Submission means to respect other people's rights and to disregard one's own rights. Assertiveness means to respect both other people's and one's own rights. Aggressiveness means to respect one's own rights and to disregard other people's rights.

Assertiveness, just like aggressiveness, is regarded as a personality trait and is to a large extent genetically conditioned, and thus it is linked to the temperament (Feshbach, & Zagrodzka 1998; Rich, & Schroedre 1976).

There are numerous classifications of assertiveness, including: positive assertiveness (laudatory), negative assertiveness (hostile) (Wolpe, 1969). Arrdinell, Sanderman, Van der Molen, Van der Ende, & Mersch, (1988). distinguish four types of assertiveness: 1) negative feelings expression, 2) acceptance and way of treatment of personal limitations, 3) initiated assertiveness,

4) praising others and the ability to accept compliments. High assertiveness is linked with louder speech, an open view, quicker reactions, longer pronouncements, more direct expression of feelings, lesser compliance, demand of greater changes in other people's comportment. The lack of assertive skills and what follows negative self-evaluation may be the beginning of the hostile aggression and personality disorders development.

Husman & Silva (1984) show the necessity to distinguish aggression from assertiveness in sport at the same time drawing attention to the field common for these two notions.

In the opinion of a Polish researcher, Rychta (2004) in sport we also encounter such an understanding of aggression according to which aggression can express normal and positive adaptive behaviour, close to non-destructive aggression or assertiveness. Many coaches and sports journalists believe that aggression in sport is a positive behaviour, an expected way to achieve success (Donahue, Rip, & Vallerand 2009; Jarvis 2006).

On the basis of the literature review we assumed that aggressiveness in sport may be described by means of three factors: 1) "Go-ahead", 2) "Tripping someone up", 3) "Assertiveness". The closest to the classical aggressiveness definition is "Tripping someone up", i.e. the actions aimed at making it impossible for the opponent (rival) to reach his goal and by the same to increase the probability of reaching one's own goal. The interdependence of these factors is presented in Figure 1.

From the perspective of sport psychology, it may be said that the aggressiveness specificity depends on the group of individuals it concerns. Aggression manifestation in sport may be more humane than typical aggression as it is commonly understood, i.e. aggression as a synonymous of evil (in the moral sense) and as a sin (in the religious sense) (Anderson, & Bushman 2002). The aggression manifestation must not always take the form of inflicting pain or suffering, or of demeaning other people.

On the basis of the theories presented above and the analysis of the studies conducted so far, it may be supposed that sportsmen behaviour is determined by different factors, including the presented level of aggressiveness. It may be also supposed that different sport disciplines may trigger different aggressiveness levels (Hagger, 2006). Thus it is reasonable to build a tool that will make it possible to measure aggressiveness level ("go-ahead", "tripping someone up" and assertiveness)

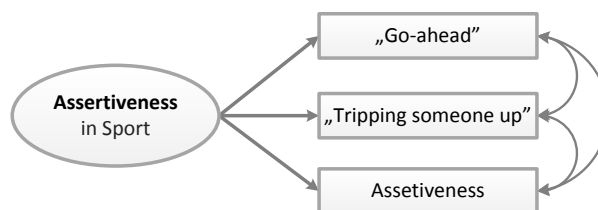


Figure 1.

of people who practice different sport disciplines.

Referring to the theoretical descriptions of the respective types of aggressiveness we prepared two independent versions of items, describing the characteristics of “go-ahead”, “tripping someone up” and assertiveness. As a result of the similarities and differences analysis one common version was created, which included 15 items for each type of aggressiveness. This list was then passed to twelve competent experts (four- and five-year students of psychology) whose task was to assign respective items to three main categories. Items with inter-rater reliability higher than 70% were included into primary questionnaire version. Thus a list of 15 items was created (5 items per each type of aggressiveness).

Description of each dimension:

„Go-ahead” – means persistent pursuit of a goal, regardless of emerging obstacles. „Go-ahead” also means truculence and aggressive entrepreneurship. In

other words „Go-ahead” means the expansion aimed at attaining new material and immaterial resources, for example prestige. This kind of aggressiveness characterizes an individual that breaks obstacles, attacks, is inflexible, courageous and fearless. “Go-ahead” also describes a person who breaks common, usual standards.

“Tripping someone up” - an individual characterized by this kind of aggressiveness has no scruples, is interested only in his own business, and considers it normal when sometimes he must trample over people to achieve the goal. This individual uses lies, intrigues and lays the blame on others if he considers this necessary to achieve his goal. He has no remorse when he resorts to bribery. In his opinion happiness is worth the “victims”. He does not attach great importance to truthfulness / honesty. He creates / engages himself in situations of morbid rivalry, frequently feigning friendship.

“Assertiveness”: an individual characterized by this kind of aggressiveness acts and expresses his/her

Items:

- 1 In order to achieve anything you need to keep pushing forward and not look to others
- 4 I usually achieve success through relentless striving to the goal.
- 7 I use every opportunity to win.
- 10 There is not such an argument that could deter me from the set goal..
- 13 „To press ahead” is the purpose in my life.

Items:

- 2 Victory is all that matters, no matter the means used to achieve it.
- 5 In order to win, I would have no scruples to discredit my rival.
- 8 To get promoted, I would have no scruples to destroy my rival.
- 11 In my opinion it is no holds barred when one strives for the victory.
- 14 I feel satisfied if I succeed in doing harm to my rival.

Items:

- 3 When I think that my coach or boss is wrong, I say it to him.
- 6 I am not afraid to reprimand my boss if I know that he is wrong.
- I argue with referees and my coach (or with my manager at work) when I am convinced that they are
- 9 wrong.
- 12 I am not afraid to defend my point, even before the persons at higher positions
- 15 For a good cause I am ready to express criticism of my boss.

Table 1. Properties of individual questionnaire items and scales reliability.

Variable	Number of items	Research group (N=686)		Women (N=522)		Men (N=164)	
		Cronbach's Alpha	Average r	Cronbach's Alpha	Average r	Cronbach's Alpha	Average r
„Go-ahead”	5	0,83	0,51	0,83	0,49	0,85	0,53
“Tripping someone up”	5	0,86	0,57	0,84	0,53	0,89	0,64
„Assertiveness”	5	0,89	0,61	0,88	0,61	0,88	0,58

opinion in a courageous way despite impending potential negative consequences. An assertive individual will not be pushed around, which means that he/she does not allow others to impose an opinion on him/her and he/she knows how to defend his/her interests and just because of that he/she does not let others to exploit or cheat him/her.

Then, we conducted first psychometric analyses designed to determine the discriminatory power of each item. We conducted the factor analysis in a mixed group of 686 men and women. At this stage we assumed that the basis of any decision should be the theoretical consistency, especially in terms of aggressiveness rating. This is why we conducted only the factor analysis restricted to three types of studied aggression without any additional exploratory analyses. The criterion of item inclusion in a given factor was the factor weight higher than 0.70 in a given category. Second comes the detailed psychometric analysis that was conducted on two independent groups.

The first group numbered 686 individuals (522 women and 164 men; $M=31,10$; $SD=10,54$; age minimum = 19, age maximum = 82).

The second group numbered 2499 individuals (1335 women and 862 men; $M=24,39$; $SD=9,16$; age minimum = 19, age maximum = 82).

The study participants were University of Gdansk and Gdansk Technical University full-time and evening study students from different study fields.

Reliability and discriminatory power

In the Table 1 we present the reliability rates of

three scales (dimensions) and discriminatory power of each item based on data from a study on 686 adult Polish men and women. The analysis results indicate that the reliability of distinguished scales is highly satisfying for both sexes. It may be noticed that the reliability of the scales of female and male attitudes is similar, so it is possible to say that the Aggressiveness in Sport Questionnaire is an equally reliable tool for measuring aggressiveness both in women and in men.

The point-biserial correlation coefficient (r_{pbi}) was used as the measure of discriminatory power of questionnaire items. The value of this coefficient varies in the range of $<-1, +1>$. The advantage of this coefficient is the possibility to use it even when the results distributions differ from the normal one. It is necessary to mention that data skew and kurtosis in all groups studied was less than 0.5 which means that we are dealing with the normal data distribution. The results are presented in Table 2.

Factor validity

For the factor validity analysis we used the technique of confirmatory factor analysis that permits to verify the hypothesis that the theoretically assumed 3-factor aggressiveness types structure fits well to the data observed in empirical studies. We used the confirmatory factor analysis using the maximum likelihood method for the structural model.

Statistics of the assessment of fit

The indices of model fit in the first group ($N=686$)

Table 2. Summary of the internal consistency analysis.

Scale	Item number	Discriminatory Power r_{pbi}	Cronbach's Alpha if item deleted
„Go-ahead”	1	0,64	0,80
	4	0,6	0,81
	7	0,61	0,81
	10	0,65	0,8
	13	0,68	0,79
Alpha = 0,83 ; average r = 0,51			
“Tripping someone up”	2	0,64	0,83
	5	0,76	0,8
	8	0,76	0,8
	11	0,65	0,83
	14	0,56	0,86
Alpha = 0,85 ; average r = 0,57			
„Assertiveness”	3	0,76	0,86
	6	0,74	0,86
	9	0,74	0,86
	12	0,71	0,87
	15	0,68	0,87
Alpha = 0,89 ; average r = 0,61			

Table 3. Differences in assertiveness degree in women and in men.

Variable	Women			Men			t	p	Cohen's d
	N	M	SD	N	M	SD			
„Go-ahead”	686	14,8	4,01	180	15,37	4,22	-1,66	>0,001	0,14
„Tripping someone up”	686	8,76	3,60	180	10,18	4,74	-4,41	>0,001	0,34
„Assertiveness”	686	17,6	3,79	180	19,36	3,67	-5,45	>0,001	0,47

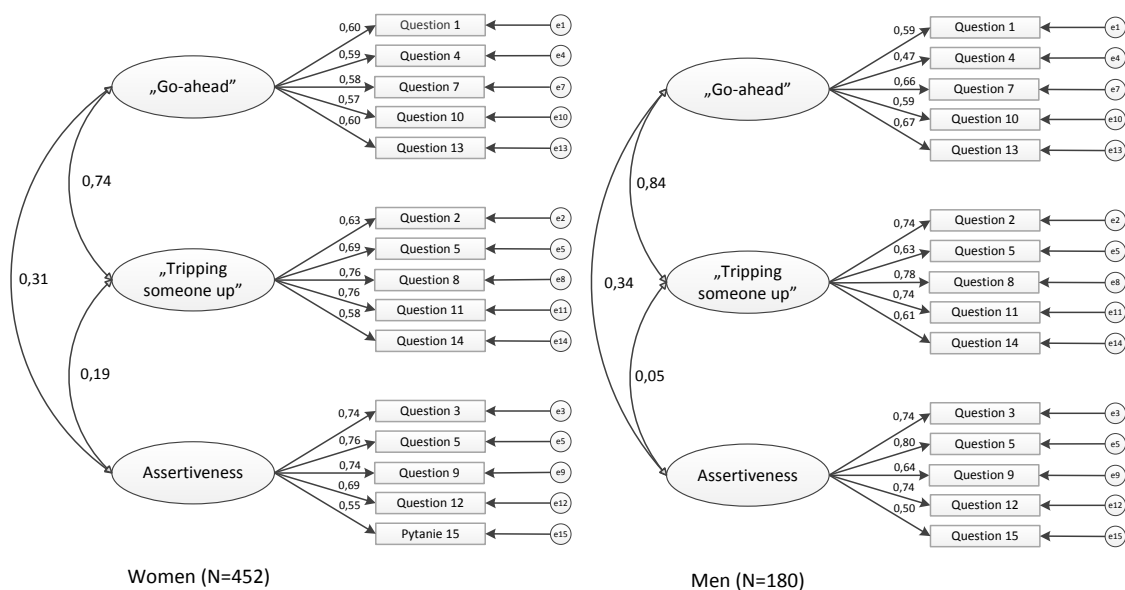


Figure 2. The outcome diagram of the questionnaire structure in the group of women (N=452) and in the group of men (N=180).

are: RMSEA=0,057; PCLOSE=0,058; Chi-sq=267,83; $p<0,001$, GFI=0,943, ECFI=0,529, for the second group (N=2499) these indices are: RMSEA=0,055; PCLOSE=0,020; Chi-sq=732,58, $p<0,001$, GFI=0,961, AGFI=0,320. We can say with high probability that the factor structure is the same in both groups. We can state that the model's goodness of fit tests in two studied groups respond positively to the question whether the hypothetically assumed model may be verified by means of the distribution of scores originating from the matrix data.

In order to further verify the validity, we tested the hypothesis that the three-factor model will have exactly the same factor loadings and correlation strength for both factors in the population of men and in the population of women. As it is shown in Table 3, there exist statistically significant differences between women and men concerning the level of "Tripping someone up" and "Assertiveness". Higher mean level of these factors was found in men. The "Go-ahead" factor does not differentiate these two groups.

As it can be seen in the Figure 2 in the group of women the correlation between „Go-ahead" and „Tripping someone up" amounted to 0,74 and in the group of

men to 0,84 (very strong correlation). The correlation between "Tripping someone up" and "Assertiveness" in women amounted to 0,19 and in men to 0,05 (weak correlation). Whereas the correlation between "Go-ahead" and "Assertiveness" in women amounted to 0,31 and in men to 0,34 (moderate correlation). Thus we can state that in the studied population the correlation between factors was similar, which allows us to ascertain with high probability that the factor structure is the same in men and in women.

The model indices of fit for women (N=452) are: RMSEA=0,056; PCLOSE=0,013; Chi-sq=212,03; $p<0,001$, GFI=0,937; AGFI=0,915, for men (N=180): RMSEA=0,063; PCLOSE=0,0111; Chi-sq=148,43; $p<0,001$, GFI=0,889; AGFI=0,848. We can state with high probability that the factor structure in both groups is the same.

Participants

In the study participated 463 sportsmen, divided into three groups. In the first group there were sportsmen practicing non contact sports: athletes, cyclists, swimmers, those doing climbing (84 women, 159 men, $M_{age} = 28.0$ years, age range: 15–63 years). Second group

Table 4. Variance analysis of the „Go-ahead”, „Tripping someone up” and „Assertiveness” variables.

Variable		Individual non contact sports	Combat sports	Team sports	F	p	n
„Go-ahead” (N=248)	M	16,86	18,52	19,85	16,655	p <0,001	0,54
	SD	4,03	3,70	3,22			
„Tripping someone up” (N=101)	M	8,95	11,03	12,92	23,916	p <0,001	0,58
	SD	3,76	4,50	4,22			
„Assertiveness” (N=119)	M	19,08	18,69	18,86	0,445	p=641	0,04
	SD	3,69	3,31	3,18			

Table 5. Fit indices of the three-factor model of aggression in four studied groups

Model fit indices	Chi-square	Chi-square /df	p	RMSEA	LO	HI	PCLOSE	GFI	ECVI
Sportsmen	900,75	2,58	<0,001	0,039	0,036	0,042	0,922	0,898	1,129
Non contact sports	131,67	1,51	0,001	0,048	0,030	0,64	0,567	0,922	0,882
Team sports	112,93	1,3	0,032	0,055	0,017	0,081	0,381	0,849	1,790
Combat sports	125,9	1,45	0,004	0,065	0,038	0,089	0,687	0,842	1,810

consisted of football, volleyball and ice hockey players (34 women, 67 men, *Mage* = 28.5 years, age range: 19–58 years). In the third group there were sportsmen practicing combat sports: boxing, judo, kick-boxing, Muay Thai, MMA, climbing (28 women, 91 men, *Mage* = 23.9 years, age range: 15–48 years). The models verification in the three studied groups was carried out by means of path model with latent variables. In the analyses we used statistical software Amos 19 and Statistica 9.0 PL. The Method of Generalized Least Squares was used for the purpose of the analysis. This is the second-popular method and it requires assumption of multidimensional normal distribution.

Statistical analysis

Obtained means and standard deviations of the studied variables are presented in Table 4, which also presents the results of unifactorial variance analysis using Sheffe’s method.

From the data presented in Table 4 it results that the highest “Go-ahead” level was found in people practicing team sports. Statistically significant differences did not exist only between people practicing team sports and people practicing combat sports. The lowest “Tripping someone up” level was found in people practicing individual non contact sports. Statistically significant differences were found between all studied groups. The “Assertiveness” level did not differentiate between the studied groups.

Fit indices of the three-factor model of aggression in four studied groups are presented in Table 5.

As it can be seen, all indices show that all four models fit well the data. The RMSEA test for all models did not exceed the critical value of 0,08. It is assumed that if it does not exceed the 0,08 value, it is still admissible. The obtained value of the PCLOSE test, which is called the assessment test of the empirical proximity of the scores matrix to the theoretical model, is higher than 0,05 for all the models. It also proves the models fit well to the data. Next criterion of the model acceptance is the value of chi-square divided by the number of degrees of freedom and it should be less than 2,5, and such a score was obtained in all models. To sum up, it may be concluded that presented goodness of fit tests in all presented models answer positively to the question whether the hypothetically created model may be verified by means of the distributions of scores originated from data matrix.

DISCUSSION AND CONCLUSION

Aggression manifestation in different situations demanding competitive activities, strategies, is a more and more frequently occurring phenomenon. One aggression type will be found in people taking part in warfare, another aggression type will be found while riding a motorcycle at high speeds, and yet another one in sport or in business. Therefore, the structure of a research tool measuring the level of aggressiveness in sportsmen seems to be a reasonable project. The baseline adopted by the Authors of the questionnaire was Buss’s (1961) aggression understanding as a relatively stable individual’s feature. On the basis of the available literature and

our own experiences, we assumed that aggressiveness in sport may be defined by three factors: “Go-ahead”, “Tripping someone up” and “Assertiveness”. The closest to the classical aggression definition is “Tripping someone up”, i.e. actions aimed at making it impossible for the rival to reach his or her goal, and by the same to increase the probability of reaching one’s own goal. Performed statistical analyses showed that the presented tool is highly promising in studying people engaged in sport activities. Presented here results of own research demonstrated that different sportsmen groups manifest different intensity of aggression operationalized in the form of three factors. Thus, it is possible to recommend the use of this tool in scientific research in sport psychology. It has a certain application value, hence it may also be useful in a broadly understood diagnosing and training of people practicing or intending to practice different sport disciplines.

The Questionnaire may be used in individual and group testing. Individual answers are rated as follows: Absolutely NOT = 1; Rather NOT = 2; Hard to say = 3; Rather YES = 4; Absolutely YES = 5.

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