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Analysis of show jumping depending on the seat and the approach type. Part I

Analiza konkursów skoków przez przeszkody w zależności od rodzaju dosiadu i sposobu najazdu. Część I

Summary. The principle of a good seat consists in keeping an active balance following the horse's movements, i.e. shifting one's own center of mass to make sure it overlaps the horse's center of mass in any situation. It would result in an optimum motion pattern, e.g. during the jump. The present study was carried out during all-Polish (ZOO***, ZOO*) and International (CSI***) Competitions held within the show jumping discipline. Four competitions were analyzed; in total, 80 riders (53 from Poland and 27 from abroad) riding 93 horses entered the competitions. The analysis of rides, conducted in a form of simple correlations, included the percentage of all seat types as well as dependencies between the type of the seat and the overcome obstacle. It was found that supple seat riding had a positive influence on overcoming the upright obstacles, double bars, and walls, while a negative one on overcoming the triple bars and oxers, for which normal seat appeared to be more efficient.

Key words: show jumping, seat type, approach type

INTRODUCTION

A proper communication between rider and horse is possible only due to an appropriate application of equestrian aids. Seat, besides legs and reins, is one of such aids. Many authors [de Nemethy 1997, Mueseler 2001, PZJ 2004a, von Dietze 2007] underlines the importance and significance of the seat, which was referred to as principle and the most direct mean of communication with a horse [de Nemethy 1997, PZJ 2004b]. It is thought that proper rider's seat, due to appropriate interaction, allows for forming dasticity of the horse during its motion [Minetti 1996, Mickunas 2006]. A principle of a good seat consists in keeping an active balance by following the horse's movements, i.e. shifting own center of mass to make sure it overlaps the horse's center of mass in any situation. It would let to achieve an optimum motion pattern, e.g. during the jump [Sasi-

mowski *et al.* 1983a, 1983b, Sasimowski i Pietrzak1987]. A conscious change in the seat type should have positive effects on horse's reactions allowing, to some degree, for free movements during approach and flying phase over an obstacle [Sasimowski *et al.* 1985].

MATERIAL AND METHODS

The study was carried out during Polish (ZOO***, ZOO*) and International (CSI***) Show Jumping Competitions. Four competitions including 80 riders (53 from Poland and 27 from abroad) riding 93 horses were analyzed, in total (Tab. 1). Due to the privacy law, competitors are presented in a form of numerical data only.

Table 1. List of particular competitions
Tabela 1. Zestawienie poszczególnych konkursów

No	Name of competition Nazwa konkursu	Type of competition Rodzaj konkursu	Height of obstacles Wysokość przeszkód	Number of riders in a competition Liczba zawodników w konkursie		Number of horses in competition Liczba koni w konkursie
				Polish polscy	foreign zagraniczni	
1	ZOO* mjr Wiktor Olędzki memorial ZOO* mem. mjr. Wiktora Olędzkiego	Open Round Runda Otwarta	120 cm	21 (22)	-	22
2	ZOO*** Barbara and Andrzej Osadziński memorial ZOO*** mem. Barbary i Andrzeja Osadzińskich	Junior Round Runda Juniorska	135 cm	8 (11)	-	11
3	CSI*** – W TORWAR – World Cup Final Central European League, VATTENFALL S.A. Prize CSI*** – W TORWAR – finał Pucharu Świata Ligi Europy Centralnej, konkurs o nagrodę VATTENFALL S.A.	Small Round Mała Runda	140 cm	14 (14)	10 (10)	24
4	CSI*** – W TORWAR – World Cup Final Central European League, Warsaw Capital City President Prize – phase I CSI*** – W TORWAR – finał Pucharu Świata Ligi Europy Centralnej, konkurs o nagrodę Prezydenta Miasta Stołecznego Warszawy – I faza	Big Round Duża Runda	145 cm	10 (13)	17 (23)	36
	Total/Razem	-	-	53 (60)	27 (33)	93

The material for study consisted of the whole rounds filmed digital camera Sony Digital 8, that were subsequently analysed referring to the technique and seat type during riding through the course depending on its difficulty. Special attention was paid to the seat type during different elements of the ride (turnings, path arch, lines, etc.). The total percentage of particular seat types applied by riders during competition as well as dividing into turnings and path arch, was analysed. In addition, division into Polish and foreign riders was used for Small and Large Round competitions. The figures are based on the number of strides made by riders in particular seat types in reference to the total number of strides during the competition.

Three general seat types were distinguished: half seat – HS, light seat – LS and full seat – FS. Half seat – the rider is bent in hips, more or less to the front, his weight is placed strongly on the thigh, knee or foot. Light seat – it is a rider's stance between full seat and half seat. Only the inner parts of the rider's thighs have contact with the saddle. Full seat – the rider sits so straight, that a vertical line may be drawn from his ear, through the shoulder, hip and ankle.

Analysis of the rides made possible to evaluate the percentage structure of all seat types, moreover dependencies between the type of seat and obstacle airborne phase could be determined in a form of simple correlations. In order to verify the occurrence of any correlation between particular seat types and obstacle form, number of strides made during a single competition by all riders in a specific seat type was taken into considerations.

Correlations were calculated and examined using Microsoft Office Excel 2007 package.

RESULTS

Riders made the largest number of strides in normal seat during analyzed competitions (Fig. 1). The overwhelming prevalence of this type of seat was the most prominent during Junior Round (67%), which could result from insufficient experiences and therefore protective riding of young competitors. The exclusion was Open Round, during which number of foules in full seat (42%) was in practice equal to this number in half seat (43%). In all competitions, light seat made up the lowest number of seat types reaching the minimum during the Small Round (9%).

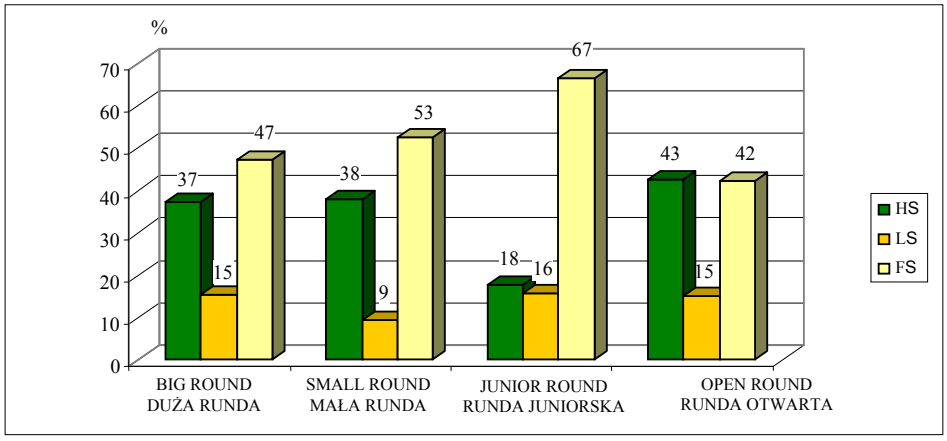

Fig. 1. Percentage of all seat types in analyzed competitions (%)
Rys. 1. Udział rodzajów dosiadu w analizowanych konkursach (%)

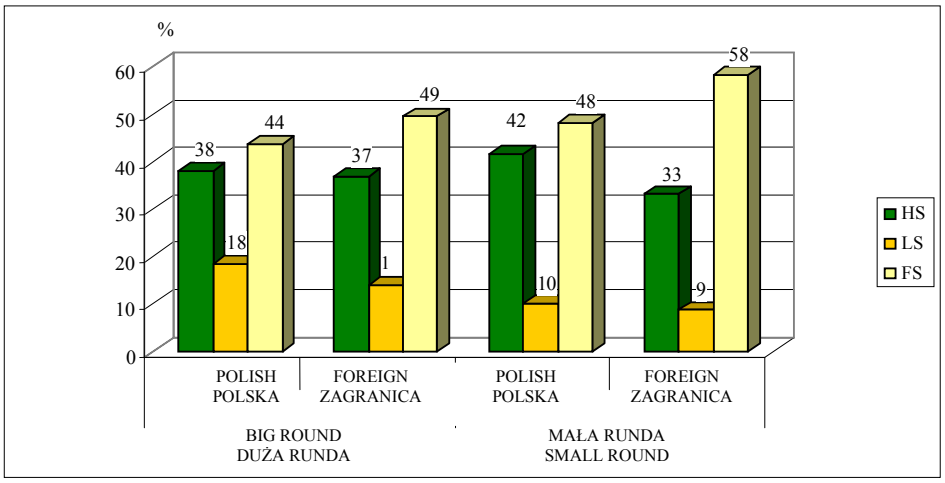

Fig. 2. Share of seat types during Large and Small Rounds taking into consideration division of riders into Polish and foreign ones (%)
Rys. 2. Udział rodzajów dosiadu w Małej i Dużej Rundzie z uwzględnieniem podziału na zawodników polskich i zagranicznych (%)

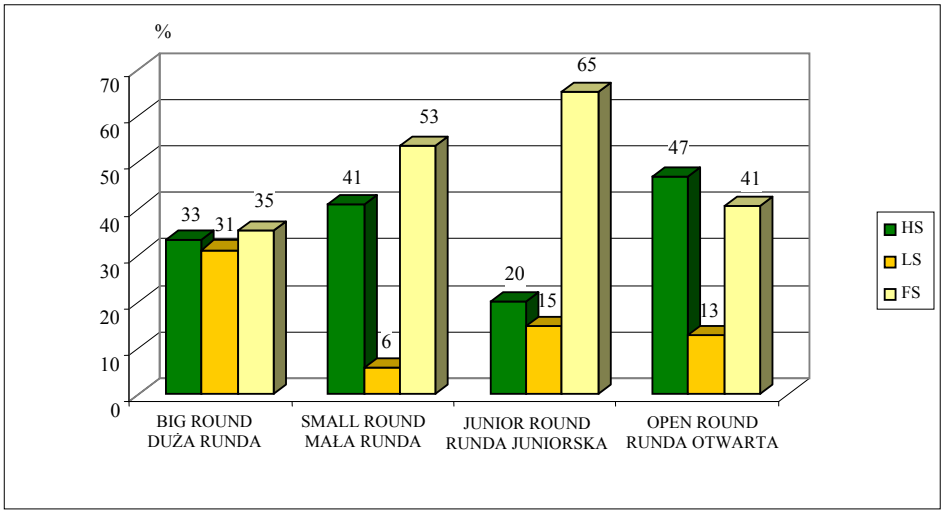

Fig. 3. Way of turnings overcoming during analyzed competitions
Rys. 3. Sposób pokonywania zakrętów w analizowanych konkursach

Both during Large and Small Round, Polish riders overcome the tracks with greater loads (making more foules in light and half seats) than foreign ones (Fig. 2). The opposite situation was observed referring to the full seat despite of the fact that values of particular seat types were similar in both competitions. It is worth to mention that some

tendency to replace the full seat with "unblocking" positions in more difficult competitions could be seen both at foreign and Polish riders. In Big Round, share of half and light seats for all competitors' rides was definitely higher than during the Small Round, which confirms the thesis on giving more freedom to the horse to overcome more difficult tracks [Peham *et al.* 2004].

In opinion of numerous show jumping instructors, a proper canter in a turning greatly determines the success in obstacle overcoming [Paalman 1979, Pollmann-Schweckhorst 2006]. The way of competitors overcome turnings during particular competitions is presented in Figure 3.

Small Round is the most diverse competition in reference to the percentage of seat type in turnings. At the same time, riders made the lowest number of foules in light seat (6%) among all competitions analyzed. On the other hand, the shares of all seat types was the most uniform in Large Round. And again, the Junior Round was the competition with the largest number of foules made in full seat (65%), while Open Round in forward seat (47%).

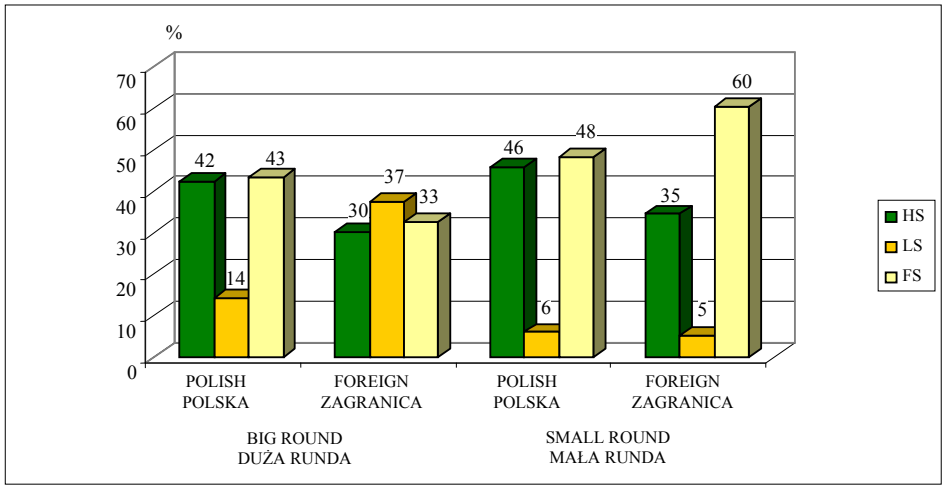

Fig. 4. Way of turnings overcoming during Large and Small Rounds taking into consideration division of riders into Polish and foreign ones (%)
Rys. 4. Sposób pokonywania zakrętów w Dużej i Małej Rundzie, z uwzględnieniem podziału na zawodników polskich i zagranicznych (%)

Taking into consideration the division of riders into Polish and foreign ones (Fig. 4), it can be observed that there were quite remarkable differences between number of foules during the seat types within particular competitions. Although, some note should be taken of very high percentage of light seat (37%) as compared to the total number of foules made by foreign riders during the Large Round. In other cases, light seat was performed only as a small proportion of all seat types. It can result from the fact that overcoming a turning in full seat allows for a full control over horse's motion and lets to make a precise obstacle approach. Such task becomes more difficult when light seat is applied and it requires more experience.

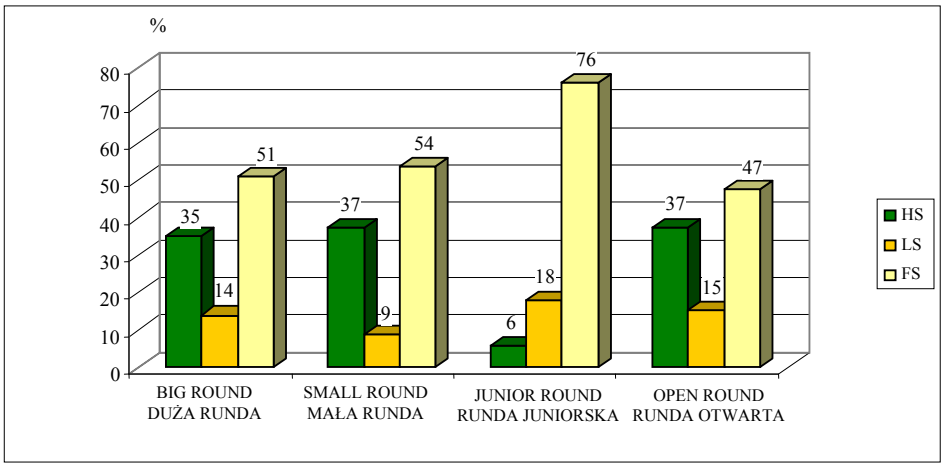

Fig. 5. Way of path arc overcoming during analyzed competitions (%)
Rys. 5. Sposób pokonywania łuków w analizowanych konkursach (%)

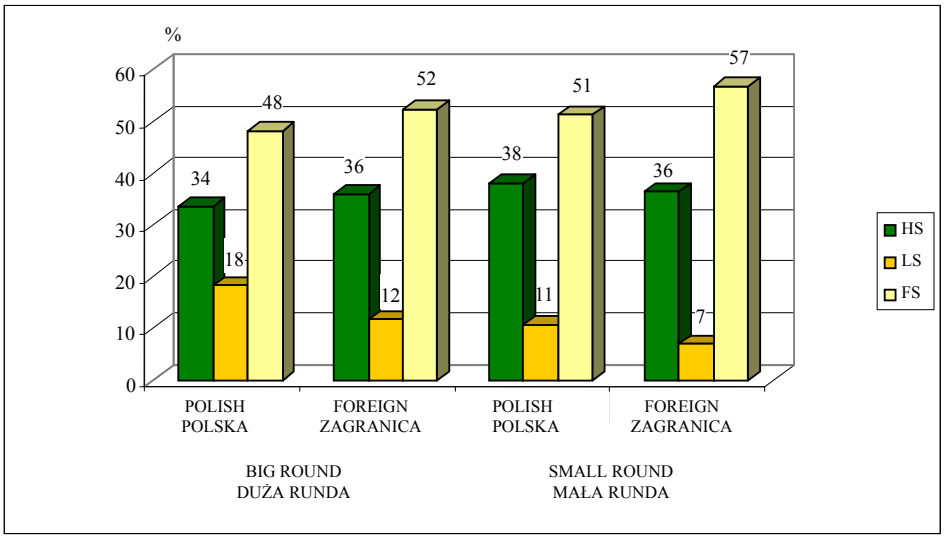

Fig. 6. Way of path arc overcoming during Large and Small Rounds taking into consideration division of riders into Polish and foreign ones (%)
Rys. 6. Sposób pokonywania łuków w Dużej i Małej Rundzie z uwzględnieniem podziału na zawodników polskich i zagranicznych (%)

Like while turnings, riders made the largest number of foules in full seat during the path arc overcoming (Fig. 5). Proportion of half seat in all competitions, except from the Junior Round (6%), was uniform amounting from 35% in Large Round to 37% in Small and Open Rounds. Junior Round was characterized by the highest percentage of full seat (76%). Quite small number of foules in light seat may suggest that it was used only in

single cases or was applied for only several moments during the whole path arch overcoming, e.g. two last foules before take-off or directly after landing.

Uniform level of both half and light seats made during the path arch overcoming can be observed when all riders were divided into Polish and foreign ones. Instead, Polish competitors prevailed in applying light seat (Fig. 6). It was confirmed by the fact that they made 6% more foules in light seats during Large Round and 4% more during Small Round than foreign riders.

Associations between seat types and various obstacles overcoming

Considering the evaluation of the associations between seat type applied by riders with overcoming various obstacles, the largest number of highly significant dependencies were observed referring to the total number of rides, without the division into particular competitions (Table 2). Highly significant correlations were recorded for using the light seat by performing the triple bars (0.351^{**}) and double bars (-0.257^{**}) obstacles.

Table 2. Correlations between seat types and penalty scores at various obstacles
Tabela 2. Korelacje pomiędzy rodzajami siadu oraz punktami karnymi otrzymanymi na różnych rodzajach przeszkód

Obstacle Przeszkoda	Total/Razem			Open Round Runda Otwarta			Junior Round Runda Juniorska		
	HS	LS	FS	HS	LS	FS	HS	LS	FS
Vertical Stacjonata	0.076	0.137	0.169	-0.036	0.216	0.170	-0.134	0.185	-0.189
Oxer Okser	0.241^{**}	0.002	0.176	0.249	-0.035	0.132	0.348	0.499	-0.562^{*}
Doublebarre Doublebarr	-0.054	-0.257^{**}	0.022	-0.435^{*}	-0.252	0.123	0.149	0.497	-0.506
Triplebarre Triplebarr	0.130	0.351^{**}	-0.087	0.132	0.440^{*}	-0.122	-	-	-
Wall Mur	0.216	0.103	$^{*}0.26$	0.392	0.173	0.373	-	-	-
Open ditch Rów z wodą	-0.073	0.211	-0.174	-	-	-	-0.073	0.211	-0.174

$^{*}P \leq 0.05$, $^{**}P \leq 0.01$
Explanations: HS – half seat, LS – light seat, FS – full seat
Objaśnienia: HS – półsiad, LS – lekki siad, FS – pełny siad

Half seat appeared to be considerably used on oxer (0.241^{**}), while full seat was only significant performed by jumping the wall (0.260^{*}) (calculated at 58 degrees of freedom).

When analyzing particular competitions, both during the Large and Small Rounds, no remarkable correlations were found, so they are not presented in the table below.

Open Round revealed highly significant dependence of light seat vs. triple bars (0.440^{*}), as well as half seat on double bars (-0.435^{*}).

During the Junior Round, the only interrelation was recorded for the full seat on oxer approach, which was statistically significant (-0.562*), although negative. So, it seems that full seat is not used in that case. Nevertheless, it indicated that exaggerated "horse closing" using full seat caused more errors when overcoming that type of obstacle [Stachurska *et al*. 2004].

DISCUSSION

Bending a torso during the half seat results from the following a horse's movements to make sure it overlaps the horse's center of mass, which would allow for performing a precise jump at complete balance [Paalman 1979, Sasimowski *et al*. 1984, Mueseler 2001]. Thus, a proper cooperation with a horse is possible only due to appropriate seat application [Mueseler 2001]. During riding a track, rider should consciously apply different types of horse loading, starting from common half seat, through various variants of a jump seat depending on a situation. The *light seat* term appeared among different forms of half and jump seats. This type of seat resembles gentle touch of a saddle by rider's buttocks. Such a position lets him a free transition from full to half seat with no disturbances of balance and forward horse's motion [www.horseandridergear.com].

Therefore, besides inborn predispositions, also rider's skills and riding way have the detrimental influence on horse's motion and its jump technique [Stachurska 2003, Mickunas 2006].

The own study revealed that the largest number of jumps was done after approaching at full seat during the Junior Round, which may resulted from insufficient experiences and therefore protective riding of young competitors. The opposite situation was observed during the Large Round, when more experienced and skilled riders entered the competition and who preferred the unloading seat (light seat). Such situation was recorded specially referring to foreign competitors who achieved the best scores during that type of competitions, which can indicate some change in the track overcoming. In addition, the thesis can be confirmed by the presence of highly significant dependencies between light and half seat on type of obstacles overcome [Stachurska *et al*. 2002].

CONCLUSIONS

1. Analysis of ways of various-difficulty-level tracks overcoming, reveals some increasing tendency referring to use of light and half seats by riders during higher-rank competitions.
2. Light seat riding affects overcoming upright obstacles, double bars, and walls, whilst it has negative effect on triple bars and oxer overcoming, for which full seat appears to be more efficient.
3. Prominent increase of "loading" seats (both at Polish and foreign riders) is obvious at such track elements as turnings and path arcs, where horses have more freedom to canter, which is necessary to make more developed jumps.
4. Domination of full seat during Junior Round may indicate slightly poorer experience of riders and resulting protective ride.
5. It seems to be reasonable to perform further studies on the occurrence of any associations between different seat type and riding effectiveness realized by riders at various levels of training skills.

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Streszczenie. Fundamentalną zasadą dobrego dosiadu jest utrzymywanie czynnej równowagi w podążaniu za ruchem konia, tj. znajdywanie środka ciężkości tak, aby pokrywał się on ze środkiem ciężkości konia w każdej sytuacji. Pozwoli to na osiągnięcie optymalnej techniki ruchu, np. podczas skoku. Badania do pracy przeprowadzono na Zawodach Ogólnopolskich (ZOO***, ZOO*) i Międzynarodowych (CSI***) rozegranych w konkurencji skoków przez przeszkody. Analizie poddano 4 konkursy, w których łącznie wzięło udział 80 zawodników (53 z Polski i 27 zagranicznych) startujących na 93 koniach. W analizie przejazdów ustalono strukturę procentową wszystkich rodzajów dosiadu oraz określono zależności, na drodze korelacji prostych, pomiędzy rodzajem dosiadu a rodzajem pokonywanych przeszkód. Stwierdzono, że jazda w lekkim siadzie pozytywnie wpływa na pokonywanie przeszkód pionowych, doublebarrów oraz murów, negatywnie natomiast na pokonywanie triplebarrów i okserów, gdzie bardziej skuteczny okazał się pełny siad.

Słowa kluczowe: skoki, rodzaj dosiadu, rodzaj najazdu