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ORIGINAL

ANALYSIS OF THE CHARACTERISTICS OF THE SMASH IN PADEL: VALIDATION OF THE OASP INSTRUMENT

ANÁLISIS DE LAS CARACTERÍSTICAS DEL REMATE EN PÁDEL: VALIDACIÓN DEL INSTRUMENTO OASP

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ABSTRACT

The purpose of this study was to design and validate an observation instrument for the analysis of the performance parameters related to the smash in padel. Eleven experts, who had to meet four of the five inclusion criteria, participated in the process. *Aiken's V* coefficient and confidence intervals were used to calculate content validity and *Cronbach's α* coefficient to analyze reliability. The adequacy and writing of the eighteen items initially designed were evaluated. Four variables were eliminated due to obtaining values <.87 in *Aiken's V* coefficient for adequacy. The rest of the variables were modified in their wording, according to the qualitative evaluations of the experts, or were considered correct. The

reliability of the instrument was acceptable, (*α*=.82). The OASP instrument is very new, as it is of interest for analyzing the use and effectiveness of the padel smash.

KEY WORDS: racket sports, smash, content validity, reliability, OASP

RESUMEN

El propósito de este estudio fue diseñar y validar un instrumento de observación para el análisis de las características del remate relacionadas con el rendimiento en pádel. En el proceso participaron once expertos, los cuales debían cumplir cuatro de los cinco criterios de inclusión. El coeficiente *V de Aiken* e intervalos de confianza se utilizaron para calcular la validez de contenido y el coeficiente α *de Cronbach* para analizar la fiabilidad. Se evaluó la adecuación y redacción de los dieciocho ítems diseñados inicialmente. Se eliminaron cuatro variables por obtener valores <.87 en el coeficiente *V de Aiken* en la adecuación. El resto de las variables fueron modificadas en su redacción, según las valoraciones cualitativas de los expertos, o se consideraron correctas. La fiabilidad del instrumento fue aceptable, (α=.82). El instrumento OASP es muy novedoso, pues resulta de interés para analizar el uso y la eficacia del remate en pádel.

PALABRAS CLAVE: deportes de raqueta, remate, validez de contenido, fiabilidad, OASP

1 INTRODUCTION

Padel is one of the most commonly practiced sports in Spain, and the number of facilities, federated clubs and sports licenses has grown notably (Courel-Ibáñez et al., 2017), and the number of federated licenses from 2008 (23371) to 2019 (75818) has increased considerably (Ministry of Education, Culture and Sport). This increase has been facilitated by the fact that in Spain there is the most consolidated professional male and female circuits in the world, the World Padel Tour (WPT), which organizes most of the tournaments in Spain.

This popularity has also been reflected in the increase in scientific publications related to this sport (Sánchez-Alcaraz et al., 2015; Villena-Serrano et al., 2016). Numerous studies have been carried out on padel, which have evaluated parameters related to performance analysis. Specifically, there is interest in the description of the competition (Courel-Ibáñez & Sánchez-Alcaraz, 2017), the technical-tactical actions that may be more effective (Courel-Ibáñez et al., 2019; Escudero-Tena et al. , 2020; Sánchez-Alcaraz, Jiménez et al., 2020), fitness (Courel-Ibáñez & Herrera-Gálvez, 2020; Sánchez-Muñoz et al., 2020), biomechanics (Gea-García et al., 2021 ; Sánchez-Alcaraz, Llana-Belloch et al., 2021) or the discovery of game indicators (Lupo et al., 2018; Fernández de Ossó, 2019; Ramón-Llin et al., 2020).

Various studies on padel have analyzed the indicators that increase the effectiveness of scoring (Torres-Luque et al., 2015; Courel-Ibáñez et al., 2015). In addition to the differences that exist between winning and losing pairs (Sánchez-Alcaraz, Courel-Ibáñez et al., 2020; Ramón-Llin et al., 2020; Courel-Ibáñez et al., 2017; Escudero-Tena, Sánchez- Alcaraz et al., 2021) or between women's and men's padel (Sánchez-Alcaraz, Pérez-Puche et al., 2020;

Sánchez-Alcaraz, Jiménez et al., 2020; Escudero-Tena, Courel-Ibáñez et al., 2021), these works show that in padel one of the most used attack actions is the smash. In addition, this attack action is the most effective to achieve success in padel, although its effectiveness decreases as the players move away from the net. Regarding the type of spin, they indicate that, although the tray is more used than the flat and topspin smash, it represents a percentage of continuity of almost 90%. Also, while the winning pairs hit more flat and topspin smashes, those who lost hit more trays. Furthermore, men use the flat and topspin smash to a greater extent to finish the point, while women use the tray more.

However, Fernández de Ossó and León-Prados (2017) and Díaz et al. (2020) are the only researchers that have designed and validated observational instruments aimed at the study of padel based on the analysis of the quantitative and qualitative judgment of a group of experts. Specifically, Fernández de Ossó and León-Prados (2017) validated an instrument to analyze various variables related to general descriptors of the match, serve and return, types of hitting, tactics, point completion and game efficiency. While Díaz et al. (2020) designed an observational instrument to describe and analyze the characteristics of the shots which end the points in padel. In contrast, there are numerous validated instruments for the analysis of play in other sports: racket sports (Torres-Luque et al., 2018; Valldecabres et al., 2019; Pradas et al., 2012; Catalán-Eslava & González -Víllora, 2015), volleyball (Suárez et al., 2017; Suárez et al., 2018), soccer (Caicedo and Vargas, 2020; López et al., 2013; García-Ceberino et al., 2020), or basketball (Chen et al., 2013; Folle et al., 2014; Moreno-Cueva & Gómez-Ruano, 2017).

An analysis of the scientific literature shows there is a shortage of validated instruments that evaluate padel performance, and none that analyze the performance parameters related to one of the most important game actions for achieving success, such as the smash. Therefore, the objective of this research was to design and validate an observation instrument to discover the performance parameters related to the padel smash.

2 MATERIALS AND METHODS

2.1 RESEARCH DESIGN

The design was classified within instrumental and ex post facto methodology (Montero & León, 2007), and the purpose of the study was to develop and validate an observation instrument to evaluate performance parameters related to the smash in padel.

2.2 PARTICIPANTS

The choice of participants in the present study was deliberate and intentional, selecting a group of experts who met the inclusion criteria established by the researchers. Expert subjects were sought, capable of transmitting knowledge and information about the object of study, as well as making assessments about it, which could provoke reflection and be of help to researchers (Escobar & Cuervo, 2008).

The sample that participated in the validation of the instrument consisted of eleven experts, who had to meet four of the five established inclusion criteria: i) possess a PhD, ii) possess the federative qualification as a padel coach and / or in another racket sport, iii) teach or have given university courses, iv) have publications with a topic oriented to the analysis of the game in padel and v) to work or have worked as a padel coach or coach of another racket sport. Only two of the experts did not meet one of the established inclusion criteria (Table 1).

Table 1. Inclusion criteria met by experts

	Experts										
	1º	2º	3º	4º	5º	6º	7º	8º	9º	10º	11º
Criterion 1											
Criterion 2											
Criterion 3											
Criterion 4											
Criterion 5											

2.3 STUDY VARIABLES

In addition to the variables that made up the instrument, other variables were identified to analyze the content validity and reliability of the tool. Content validity is defined as the degree to which a variable adequately represents the instrument (Thomas et al., 2015). In this study, the technique used to achieve an optimal level of content validity was the assessment based on the criteria of experts (Bulger & Housner; 2007). The experts assessed the suitability and writing sections of each variable through a quantitative scale from 1 to 10. Adequacy is the extent to which a variable is considered relevant and should be part of the tool. On the other hand, the wording makes reference to a variable that is correctly written. Likewise, the experts made a general qualitative assessment of each element if they believed it appropriate, where they expressed their alternative to certain aspects that would improve, personally. Reliability, understood as the internal reproducibility of a measure (Thomas et al., 2015), was measured using Cronbach's α coefficient.

2.4 INSTRUMENT

After reviewing the scientific literature, an instrument was designed that collects a series of contextual or situational variables that define the game, the players and the state of play and various specific variables that analyze the characteristics of the smash in padel or the game action that it is intended to analyze. Following Anguera and Hernández-Mendo (2016), the variables that made up the instrument were defined on the basis of their categorical core and degree of openness.

Among the variables that describe the situation or context in which a smash is carried out is the difference between the pair that wins the match and the one that loses it, in order to discover if the use of a smash with certain characteristics is related with obtaining success in the match. Various investigations indicate that the most effective attack action to achieve success is the smash (Sánchez-Alcaraz, Jiménez et al., 2020; Ramón-Llin et al., 2020).

In padel it is important to know the position of the player on the court, depending on whether he or she is on the left (backhand) or right (drive) side. Previous research indicates that the performance on the court of the players who are positioned on the left side is different from that of the players on the right side (Sánchez-Alcaraz, Ferrer et al., 2021; Ramón-Llin et al., in press).

In addition, the data obtained in other studies suggest that the performance profile of padel players differs according to their hand dominance (Courel-Ibáñez & Sánchez-Alcaraz, 2018; Sánchez-Alcaraz, Ferrer et al., 2021), therefore this tool also takes laterality into account.

The pair that serves during a game has a significant advantage over the other pair, especially in the first seconds of the game (Sánchez-Alcaraz, Muñoz et al., 2020; Ramón-Llin et al., 2019), for that one instrument variable is punch status. So, the fact of serving or returning may influence the use of the smash.

The partial result of the game, the set or the match are also items to be included in this tool. It is very interesting to know what the players do according to whether they are winning, losing or tying, since various investigations have shown that players act differently according to the score (Escudero-Tena et al., 2020; Sánchez-Alcaraz et al., 2019; Muñoz et al., 2017).

The effectiveness of the action decreases as the paddle players move away from the net (Sánchez-Alcaraz, Pérez-Puche et al., 2020). Therefore, it is important to know where the ball is hit from when smashing. It is also interesting to know where the ball comes from, since it is not the same to smash a ball that comes from a parallel, cross-court or is hit from the center of the court.

Although no studies have been found that analyze the streak in padel. The number of points previously won or lost can affect the way the next point is played; therefore, this variable has been included in the instrument.

Another item that is collected in this tool is the key point, since there are several studies that have analyzed the key points in padel (Muñoz et al., 2017; Díaz et al., 2015), suggesting that players use longer rest times before points that can affect the score (key points), which could be directly related to physiological (recovery), tactical and psychological factors, due to the importance of the points.

One of the specific variables of the instrument consists in identifying if the smash is made in a jump or statically. This variable is novel, since it is interesting to know how a smash is more commonly used and effective.

Flat and topspin smashes are shots that achieve a high percentage of effectiveness. On the contrary, the trays or sliced smashes represent a percentage of continuity of points of almost 90% (Sánchez-Alcaraz, Perez-Puche et al., 2020). Cross-court shots are more effective, since the possibility of winning the point increases (Courel-Ibáñez et al., 2019; Ramón-Llin et al., In press). In this instrument, various variables have been developed (type of smash, completion of the smash, direction ...) in order to discover which smash, according to its characteristics, is most used. Likewise, the smash effectiveness variable, widely used in previous research (Ramón-Llin et al., 2020; Sánchez-

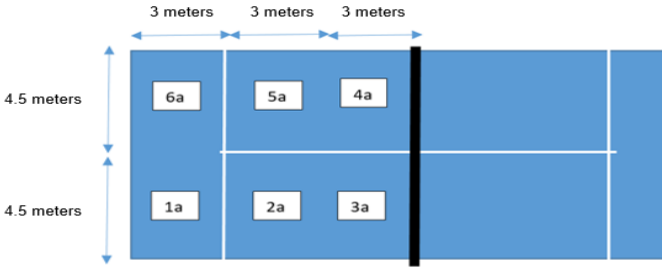
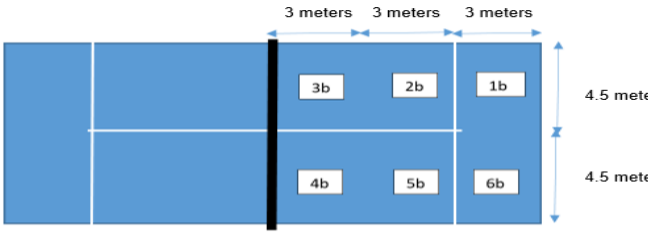
Alcaraz, Perez-Puche et al., 2020), has been included to determine the effectiveness of each type of smash. In addition, the variable order of the rally has been included, to know the moment during the point in which each smash takes place.

Finally, the number of shots per point is a variable that has been studied in padel by several researchers (Sánchez-Alcaraz, 2014; Torres-Luque et al., 2015), and for this reason it has been incorporated. These studies show an average of approximately 9-10 shots per point.

A first version of the instrument was developed taking these variables into account. The initial definition of the 18 designed variables, their categorical core and the opening range for the observational analysis tool of the smash in padel (observational analysis of the smash in padel), are presented in Table 2.

Table 2. Category system of the OASP tool

Variables	**Description**	**Degree of opening**
1. Pair	Pair of the player who executes the smash based on the final result of the match	1. Pair that wins the match 2. Pair that loses the match
2. Player	Position of the player performing the smash on the court	1. Drive 2. Reverse
3. Laterality	Dominant hand of the player performing the smash	1. Right-handed 2. Left-handed
4. Service status	Defines if the partner of the player who performs the smash is in the serving or returning pair	1. Returning pair 2. Serving pair
5. Partial game result	Partial result of the game of the pair whose player performs the smash	1. 0-0 2. 15-0 3. 0-15 4. 15-15 5. 30-15 6. 15-30 7. 30-30 8. 40-15 9. 15-40 10. 40-30 11. 30-40 12. 40-40 13. Advantage-40 14. 40-advantaje 15. Tie-break
6. Partial set result	Partial result of the set of the pair whose player performs the smash	1. 0-0 2. 1-0 3. 0-1 4. 1-1 5. 2-1 6. 1-2 7. 3-1 8. 1-3 9. 4-1 10. 1-4 11. 5-1 12. 1-5 13. 2-2 14. 3-2 15. 2-3 16. 4-2 17. 2-4 18. 5-2 19. 2-5 20. 3-3 21. 4-3 22. 3-4 23. 5-3 24. 3-5 25. 4-4 26. 5-4 27. 4-5 28. 5-5 29. 6-5 30. 5-6 31. 6-6
7. Partial match result	Partial result of the match of the pair whose player performs the smash	1. 0-0 2. 1-0 3. 0-1 4. 1-1
8. Key point	Points that could have an impact on the result of the match, in which either pair had the option of winning a game, set or match	1. Yes 2. No

9. Streak	Defines if the smash player's pair won or lost the previously played point (s)	1. Won the previous point 2. Won the 2 previous points 3. Won the 3 previous points or more 4. Lost the previous point 5. Lost the 2 previous points 6. Lost the 3 previous points or more 7. First point of the match
10. Area where the ball comes from	Area from which the shot before the smash is made 	1. 1a 2. 2a 3. 3a 4. 4a 5. 5a 6. 6a
11. Hitting zone	Area from which the smash is made 	1. 1b 2. 2b 3. 3b 4. 4b 5. 5b 6. 6b
12. Props	Defines if the player performing the smash is with the feet on the ground or is in the air at the moment of the shot	1. Stopped 2. In suspension
13. Smash type	Effect with which the player performing the smash hits the ball	1. flat smash 2. topspin Smash 3. Tray
14. Smash direction	Path taken by the ball once it has been hit by the player performing the smash	1. Parallel 2. Cross-court
15. Smash completion	Place where the ball ends after the player has smashed	1. X3 2. X4 3. Goes back to own side 4. Is on the opponent's side
16. Smash effectiveness	Consequence that occurs when the player of a pair performs the smash	1. Winner 2. Forced error 3. Unforced error 4. Does not end point
17. Rally order	Shot during the point at which the smash is performed	1. Very soon (2nd – 6th shot) 2. Soon (7th - 11th shot) 3. Normal (12th – 16th shot) 4. Late (17th - 21st shot) 5. Too late (22nd or more shots)
18. Rally	Number of shots during the point	1. Very short (2 - 8 shots) 2. Short (9 - 16 shots) 3. Normal (17 - 24 shots) 4. Long (25 - 32 shots) 5. Very long (33 or more shots)

2.5 PROCESS

After a bibliographic review, the problem statement was identified and a tool was built that would analyze the performance parameters related to the padel smash. Once the variables and categories were defined, the researchers deliberately and intentionally selected a group of experts who met the established inclusion criteria. Upon the response of the experts, the data were recorded in an Excel sheet. Quantitative data were used to calculate content validity through *Aiken's V* coefficient and confidence intervals and reliability from *Cronbach's α* coefficient. Qualitative data were used to improve the final writing of the instrument.

2.6 DATA ANALYSIS

Content validity was calculated using Aiken's V coefficient (Aiken, 1985), which is used to quantify the relevance of a variable with respect to a group of experts. Its value ranges between .00 and 1.00, where the latter indicates a perfect agreement between the experts regarding the content evaluated. For its calculation, the Visual Basic 6.0 software developed by Merino and Livia (2009) was used, which applies the formula modified by Penfield and Giacobbi (2004), where $\bar{X}$ refers to the mean of the scores obtained by the judges, ι is the lowest value on the scale (1) and *K* is its range (10-1=9).

$$V = \frac{\bar{X} - \iota}{K}$$

Furthermore, this application makes it possible to obtain confidence intervals at the 90, 95 and 99% levels using the *score* method (Peinflied & Giacobbi, 2004). This confidence interval calculation is a confirmatory test that shows greater goodness for the creation of instruments designed for the first time (Merino & Livia, 2009).

To establish the criteria for elimination, modification or acceptance of variables, the initial formula proposed by Aiken (1985) was followed, applying the central limit theorem. In his calculation proposal, *z* = significant value of content validity; *m* = number of variables; *n* = number of experts and *c* = range of the scale.

$$V = \frac{z}{.2\sqrt{\frac{3mn(c-1)}{(c+1)}}} + .5$$

he criteria used by other researchers were followed when validating instruments, using the cut-off point to eliminate an item at a 95% confidence interval. When the values were between 95% and 99% confidence intervals, the items should be improved. An item is considered to be correctly designed when it has a confidence interval value greater than 99% (García-Ceberino et al., 2020; Ibáñez et al., 2019). It is a highly demanding criterion for the validation of a tool. Therefore, in the present investigation, variables with mean values lower than .87 in *Aiken's V* (below a 95% confidence interval) were eliminated, variables with mean values between .87 and <1.00 (between the 95% and 99%), and the

variables with mean values at 1.00 (greater than 99%) were considered correct (Table 3).

Table 3. Criteria to follow for the acceptance, modification or elimination of the variables

		Wording		
		1.00	[.87-<1.00]	<.87
Adequacy	1.00	Correct	Wording is modified	Wording is modified
	[.87-<1.00]	Adequacy is modified	Adequacy and wording are modified	Adequacy and wording are modified
	<.87	It is eliminated	It is eliminated	It is eliminated

Cronbach's α coefficient (Cronbach, 1990) was used to analyze the reliability of the instrument. This coefficient is used to check if the instrument being evaluated collects faulty information and therefore would lead to wrong conclusions or, on the other hand, if it is a reliable instrument that makes stable and consistent measurements. Thus, Field (2009) shows that an acceptable reliability is considered from .70. Although other authors indicate that it would be more advisable to obtain values above .80 (Gleim & Gleim, 2003; Polit & Hungler, 2000). Statistical analysis was performed with SPSS v.21 software (IBM Corp. 2012. IBM SPSS Statistics for Windows, NY: IBM Corp. USA).

3 RESULTS

Table 4 shows the results obtained in *Aiken's V* coefficient and their confidence intervals regarding adequacy.

Table 4. Results of Aiken's V coefficient and confidence intervals (Adequacy)

Variables	Adequacy								
	A	*V*		90% CI		95% CI		99% CI	
				low.	upp.	low.	upp.	low.	upp.
1	10	1.00		.97	1.00	.96	1.00	.93	1.00
2	9.91	.99		.95	.99	.94	.99	.92	.99
3	10	1.00		.97	1.00	.96	1.00	.93	1.00
4	10	1.00		.97	1.00	.96	1.00	.93	1.00
5	10	1.00		.97	1.00	.96	1.00	.93	1.00
6	10	1.00		.97	1.00	.96	1.00	.93	1.00
7	10	1.00		.97	1.00	.96	1.00	.93	1.00
8	8.64	.85	*	.78	.89	.76	.90	.73	.91
9	8.36	.82	*	.74	.87	.73	.88	.70	.89
10	10	1.00		.97	1.00	.96	1.00	.93	1.00
11	10	1.00		.97	1.00	.96	1.00	.93	1.00
12	10	1.00		.97	1.00	.96	1.00	.93	1.00
13	10	1.00		.97	1.00	.96	1.00	.93	1.00
14	10	1.00		.97	1.00	.96	1.00	.93	1.00
15	10	1.00		.97	1.00	.96	1.00	.93	1.00
16	9.91	.99		.95	.99	.94	.99	.92	.99
17	8.00	.78	*	.70	.83	.68	.84	.65	.86
18	8.55	.84	*	.76	.89	.75	.89	.72	.91

CI= Confidence interval; low.= Lower limit; Upp.= upper limit; A = Average; V= Aiken´s V coefficient; * <.87

It can be observed that except for variables 8 (key point), 9 (streak), 17 (order of the rally) and 18 (rally), all variables exceed the critical value for Aiken's V with respect to the adequacy established at .87. Therefore, these variables were removed from the record sheet.

Table 5 shows the results obtained after calculating *Aiken's V* coefficient and its confidence intervals regarding the wording.

Table 5. Results of Aiken's V coefficient and confidence intervals (Wording)

Variables	Wording								
	A	V		90% CI		95% CI		99% CI	
				low.	upp.	low.	upp.	low.	upp.
1	10.00	1.00		.97	1.00	.96	1.00	.93	1.00
2	8.82	.87		.80	.91	.78	.92	.75	.93
3	10.00	1.00		.97	1.00	.96	1.00	.93	1.00
4	10.00	1.00		.97	1.00	.96	1.00	.93	1.00
5	9.27	.92		.86	.95	.84	.95	.82	.96
6	10.00	1.00		.97	1.00	.96	1.00	.93	1.00
7	10.00	1.00		.97	1.00	.96	1.00	.93	1.00
8	7.45	.72	*	.63	.78	.62	.79	.59	.84
9	8.73	.86	*	.79	.90	.77	.91	.74	.81
10	9.82	.98		.94	.99	.92	.99	.90	.92
11	10.00	1.00		.97	1.00	.96	1.00	.93	1.00
12	9.36	.93		.87	.96	.86	.96	.83	.97
13	9.27	.92		.86	.95	.84	.95	.82	.96
14	10.00	1.00		.97	1.00	.96	1.00	.93	1.00
15	10.00	1.00		.97	1.00	.96	1.00	.93	1.00
16	7.91	.77	*	.69	.82	.67	.83	.64	.85
17	7.55	.73	*	.64	.79	.63	.80	.60	.82
18	7.55	.73	*	.64	.79	.63	.80	.60	.82

CI= Confidence interval; low.= lower limit; upp.= upper limit; A = Average; V= Aiken´s V coefficient; *<.87

As in the adequacy, the experts stated that the wording of variables 8 (key point), 9 (streak), 17 (order of the rally) and 18 (rally), should be revised. Variable 16 (effectiveness of the smash) was added to these four variables. All of them did not exceed the critical value for *Aiken's V* with respect to the wording. Therefore, it was necessary to pay special attention to these variables in order to improve their wording.

Table 6 shows, by way of example, the qualitative assessments provided by the experts. As well as the actions that were taken accordingly.

Table 6. Qualitative evaluations by experts

Variables	Nº of contributions	Example	Action
2	4	It would be more convenient to indicate right side and left side of the court	The degree of openness has been changed to "player on the right side" and "player on the left side"
5	3	Please note the new WPT scoring system. "Golden point"	It has been indicated that if the tool is used to analyze matches of the WPT competition in the opening range of this variable, it would be modified, eliminating the option 40-

			advantage or advantage-40
8	5	This variable is very subjective. I think any point from a tie-break can be more key than a 40-0 from a first game of a set.	This variable was removed from the tool.
9	5	I don't see it is interesting. It can give problems in the analysis. I see it as unnecessary.	This variable was removed from the tool.
10	1	What if the ball comes from outside the court?	The open range of the variable has been changed. Introducing 7. 7a (off the court)
12	2	I would substitute in suspension for “in a jump”. I would substitute the degree of openness for no support, one support or two supports.	It was changed from suspension to jump.
13	1	It may be the case that the smash is backhand and you do not identify it (very common in smashes that fall short).	We consider that the term to which the expert is referring is a recovery and not a smash
16	7	Following in the wake of other validated tools in racket sports, perhaps “the point does not finish” can be replaced by “continuity”. How is the observer going to differentiate an unforced error from a forced error? There are no unforced errors as there is rival opposition.	The degrees of opening in continuity, error and winning shot were redefined
17	8	This variable does not depend only on the smash, but on many more actions. Justify opening ranges based on the scientific literature, by quartiles, by cluster ...	This variable was removed from the tool.
18	9	This variable does not depend only on the smash, but on many more actions. Justify opening ranges based on the scientific literature, by quartiles, by cluster ...	This variable was removed from the tool.

Finally, Table 7 collects the values obtained in the reliability of the tool with Cronbach's α coefficient.

Table 7. Reliability analysis of the OASP instrument

	Adequacy	Wording	Total
α	.81	.82	.82
Valid	18	18	36

4 DISCUSSION

The purpose of this study was to design and validate an observation instrument for the analysis of the smash in padel with guarantees of validity and reliability. A tool has been generated, the OASP, which finally records 14 items and allows us to analyze this game action which is so important for padel performance. There are few investigations that have validated and designed observation instruments in padel (Díaz et al., 2020; Fernández de Ossó & León, 2017). In addition, an instrument has not been designed that specifically analyzes the different parameters of the smash in padel, despite the fact that this action has been the object of study of various investigations in different contexts (Ramón-Llin et al., 2020; Sánchez-Alcaraz, Pérez-Puche et al., 2020; Sánchez-Alcaraz, Jiménez et al., 2020). Thus, although these investigations have helped to define the instrument, the present one will allow us to discover the use and effectiveness of the action in different situations of padel in a valid and reliable way.

Dunn et al. (1999) and Bulger & Housner, (2007) establish a series of basic criteria for the validation of an instrument to be satisfactory: i) the selection criteria for the experts; ii) the number of experts that comprise the panel; (iii) the procedure used by the experts to assess the validity of content; (iv) the statistical or quantitative procedures to evaluate the experts' scores; and (v) the selection criteria used to determine whether the items are kept, modified, or eliminated from the final item proposal to be included in the instrument. These five phases will be followed in the discussion of the results. In addition, the results of the internal consistency of the instrument will be compared.

The selection criteria for the expert group have been rigorously defined for this study. All the experts were PhDs, except one who is in the process, guaranteeing his scientific training. In addition, having publications with a topic oriented to the analysis of the game in padel and teaching or having taught at university are some of the established inclusion criteria that all experts met despite their specificity and suitability for this study. Criteria similar to those used in this research have been used by other researchers for the validation of their instruments. García-Martín et al. (2016), Ibáñez et al. (2019) and Díaz et al. (2020) employed PhDs doctors and university professors in their validation. For their part, Ibáñez et al. (2019) and García-Ceberino et al. (2020) selected experts who had scientific publications related to the topic to be analyzed. The inclusion criterion of meeting 80% or more of the inclusion criteria / factors to be part of the experts has also been used in other investigations of this nature (Díaz et al., 2020; García-Ceberino et al., 2020). Thus, the quality of the experts participating in the study guarantees that the opinions expressed are of sufficient rigor and quality for the final validity of the OASP tool.

Bulger and Housner (2007) and Dunn et al. (1999) reflect on the number of components that make up the group of experts. Various studies specific to the sports field show that ten or more subjects offer an acceptable estimate for the content validity of a validation instrument (García-Martín et al., 2016; Gómez et al., 2014; Villarejo et al., 2014). This research meets this requirement, as it has the assessment of eleven experts. Therefore, the contributions of these experts are sufficient in quantity and quality for the validation of this observation tool.

The experts performed a quantitative and a qualitative assessment of each of the items described to analyze the characteristics of the smash in padel, a procedure similar to those carried out in other studies (García-Ceberino et al., 2020; Díaz et al., 2020). The quantitative scores of the experts were made on a scale of 1 to 10 to assess the wording and the adequacy of the items (García-Ceberino, et al., 2020; Díaz et al., 2020); other studies have proposed a smaller rating scale (Collet et al., 2018). Larger rating scales allow experts to discriminate on the suitability of an item.

For statistical or quantitative procedures, a highly demanding criterion used by other researchers was followed to assess the content validity of a tool (García-Santos & Ibáñez, 2016; García-Martín et al., 2016; Díaz et al., 2020; Gamero et al., In press). Using the cut-off point to eliminate a variable at a 95% confidence interval, four of the eighteen variables were eliminated (key point, streak, order of rally and rally), as they reached values lower than .87 in Aiken's V coefficient of adequacy. The experts considered that these items should not be

part of the construct of actions that allow a correct definition of a smash in padel.

When the values were between 95% and 99% confidence intervals, the items were improved. Therefore, five variables were modified, obtaining values between .87 and 1.00 in Aiken's V coefficient in adequacy or in the wording. Specifically, the variables "player, partial result of the game, area where the ball comes from, support and effectiveness of the smash" were modified. For their modification, the qualitative evaluations of the experts were taken into account, being essential for the final completion of the instrument (Bulger & Housner, 2007; Carretero & Pérez, 2007). In the variable "player" the degree of opening was changed by player on the right side and player on the left side. In the "partial result of the game" the categories of the opening range advantage-40 and 40-advantage were not to be taken into account, if the instrument is used for the analysis of World Padel Tour matches. Category 7a (off-court) was included in "area where the ball comes from". The category in suspension was replaced by in a jump in the variable "supports" and in the item "effectiveness of the smash" the rank was modified by winner, error and continuity.

Finally, an item is considered to be correctly designed when it has a confidence value greater than 99% (Ibáñez et al., 2019; García-Ceberino et al., 2020), that is, when Aiken's V coefficient is 1.00. Thus, the rest of the variables were considered correct, which indicates that in the initial design of the tool there was great respect for the criteria defined by the experts for the observational variables used to record sports actions.

The results obtained show that the OAPS tool is reliable, reaching values higher than those established by the experts as a reference (Gliem & Gliem, 2003; Polit & Hungler, 2000). Studies that validate observational tools for the analysis of sport (Gamonales et al., 2018; Díaz et al., 2020), of referees (García-Santos and Ibáñez, 2016) or for the training of athletes (Collet et al., 2019) also reach optimal reliability values using the same procedure as this research. Therefore, this instrument is considered to be reliable, that is, it has sufficient internal consistency, ensuring that the items measure the constructs of the action consistently.

Once the pertinent eliminations or modifications recommended by the group of experts had been made, a new proposal for the instrument was prepared. This was composed of 14 variables, contextual or situational, which define the game, the players and the state of play and specific ones, which analyze the characteristics of the smash in padel. Thus, the inclusion of all these items to define the action of the smash in padel, make the OAPS tool a complete, reliable and valid instrument that can be used for the analysis of the game. It should be noted that for its implementation, training of the coders will be necessary to guarantee their familiarization with the items.

5 CONCLUSIONS

The observation instrument designed in the present investigation to discover the performance parameters related to the padel smash is complete, valid and reliable. Therefore, it can be used as a means of observation to analyze the use of the padel smash with certain characteristics in the different real game

situations and its effectiveness. In addition, it can help players in making technical-tactical decisions and coaches in planning specific training tasks by having detailed information about the development of the game. Thus, it would be convenient to use this tool in different sports categories and in both men's and women's padel. Finally, it should be noted that due to the number of items and experts, a very high cut-off point was obtained, at a 99% confidence interval for direct acceptance, so the requirement was very high.

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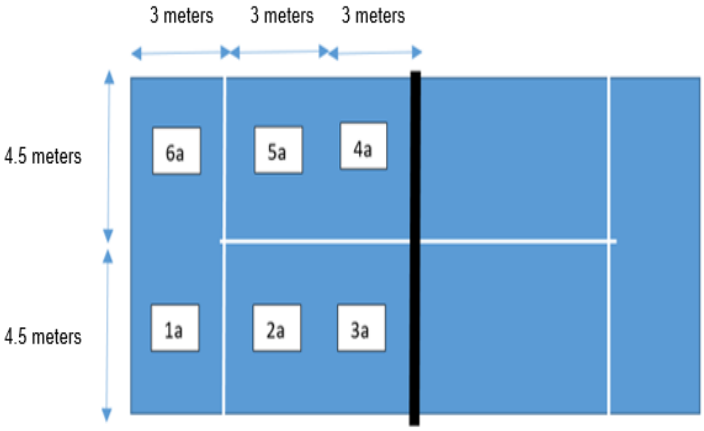
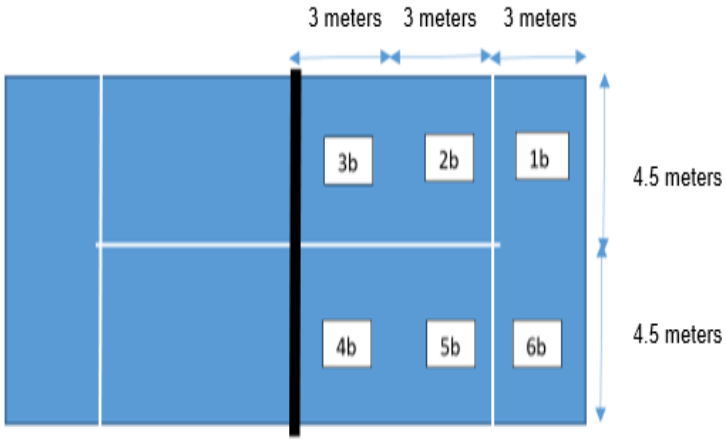
ANNEXED 1

OASP tool category system

Variables	Description	Degree of opening
1. Pair	Pair of the player who executes the smash based on the final result of the match	1. Pair that wins the match 2. Pair that loses the match
2. Player	Position of the player performing the smash on the court	1. Right side player 2. Left side player
3. Laterality	Dominant hand of the player performing the smash	1. Right-handed 2. Left-handed
4. Service status	Defines if the partner of the player who performs the smash is on the serve or the return	1. Serving pair 2. Returning pair
5. Partial game result	Partial result of the game of the pair whose player who performs the smash	1. 0-0 2. 15-0 3. 0-15 4. 15-15 5. 30-15 6. 15-30 7. 30-30 8. 40-15 9. 15-40 10. 40-30 11. 30-40 12. 40-40 13. Advantaje-40* 14. 40-advantaje* 15. Tie-break
6. Partial set result	Partial result of the set of the pair whose player performs the smash	1. 0-0 2. 1-0 3. 0-1 4. 1-1 5. 2-1 6. 1-2 7. 3-1 8. 1-3 12. 1-5 13. 2-2 14. 3-2 15. 2-3 16. 4-2 17. 2-4 18. 5-2 19. 2-5 23. 5-3 24. 3-5 25. 4-4 26. 5-4 27. 4-5 28. 5-5 29. 6-5 30. 5-6

		9. 4-1 20. 3-3 31. 6-6 10. 1-4 21. 4-3 11. 5-1 22. 3-4
7. Partial match result	Partial result of the match of the pair whose player performs the smash	1. 0-0 2. 1-0 3. 0-1 4. 1-1
8. Area where the ball comes from	Area from which the shot before the smash is made 	1. 1a 2. 2a 3. 3a 4. 4a 5. 5a 6. 6a 7. 7a (off the court)
9. Hitting area	Area from which the smash is made 	1. 1b 2. 2b 3. 3b 4. 4b 5. 5b 6. 6b
10. Supports	Defines whether the player performing the smash is with the feet on the ground or is in the air at the moment of the shot	1. Standing 2. In a jump
11. Type of smash	Effect with which the player making the smash hits the ball	1. Flat smash 2. Topspin smash 3. Tray
12. Direction of the smash	Path taken by the ball once it has been hit by the player performing the smash	1. Parallel 2. Cross-court
13. Completion of the smash	Place where the ball ends after the player has smashed	1. X3 2. X4

		3. Goes back to own court 4. Stays in the opponent's court
14. Efficacy of the smash	Consequence that occurs when the player of a pair performs the smash	1. Winner 2. Error 3. Continuity

*It is omitted if World Padel Tour matches are analyzed

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