

EFFECT OF TWO DIFFERENT FORMS OF THREE-POINT LINE ON GAME ACTIONS IN GIRLS' MINI-BASKETBALL

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ABSTRACT

The aim of this study was to compare two different designs of the three-point line to analyze which one allows for a higher frequency of motor actions that, according to the literature, should be strengthened when including a three-point line in youth basketball. In the first of two championships, female mini-basketball players (N=67) played with a three-point line delimited by the free throw lane, while during the second one, they played with a rectangular three-point line. Four observers were trained. The reliability reached values between .90 and .98. The Mann-Whitney U Test was used to determine if there were significant differences among the averages of the compared variable. When participants used the three-point line delimited by the free throw lane, there were increases in the percentage of ball possessions that ended in a shot ($U=1280785$, $Z=-3.827$, $p=.000$), that ended in shots from zones A ($U=1286321$, $Z=-3.531$, $p=.000$) and C ($U=1356614$, $Z=-2.182$, $p=.029$), in standard shots ($U=1294771$, $Z=-3.269$, $p=.001$), in hook shots ($U=1358526$, $Z=-3.176$, $p=.001$), in three-point shot attempts ($U=1314902$, $Z=-6.600$, $p=.000$) and in successful three-point shots ($U=1355201$, $Z=-3.888$, $p=.000$). This study confirms the necessity of consulting with analysts before introducing and modifying a rule in sport.

Key words: Basketball; Rule modification; Shot; Youth sport.

INTRODUCTION

Jay Archer created mini-basketball as an adaptation of basketball for children's characteristics and needs so that they could play and enjoy it in accordance with their capabilities. In Spain, according to regulations by the Spanish Basketball Federation (SBF), mini-basketball is played between two teams of five players each, who are 11 years of age and under. Six periods of eight minutes are played on a court measuring 28 x 15 meters in which there are two basketball hoops at a height of 2.60 meters. According to Piñar *et al.* (2002/2003), Piñar (2005) and Arias *et al.* (2009), ball possessions that end in shot attempts, successful shots, lay-ups, hook shots, shot attempts from distances greater than four meters or from positions outside the free throw lane ("lane") are scarcely carried out in mini-basketball. Additionally, since there is no three-point line, players cannot score three-point baskets. This, and the fact that players attempt few shots outside of four meters, limits their play and enjoyment in accordance with their capabilities. The SBF proposed a three-point line delimited by a rectangular area similar to a goal area in soccer. With this new rule in mind,

some organizations (counties basketball federations and the counties governments) in each Spanish autonomous community opted to use a three-point line delimited by the rectangular area, while others opted to use the line that delimits the free throw lane as a three-point line (see Figure 1). However, none of the organizations conducted studies beforehand to assess the impact that either of these two lines can have on the game actions of mini-basketball players during the game. From reference studies, the three-point line should facilitate the development of situations that end in a shot, that strengthen the shot from outside of the free throw lane, lay-ups and hook shots and that increase the number and effectiveness of three-point shots (D'Silva *et al.*, 1988; Andreasen, 1990; Adams, 1991; Piñar *et al.*, 2002/2003; Piñar, 2005; Arias *et al.*, 2008/2009). However, information does not exist about what type of three-point line facilitates these motor actions to the greatest extent.

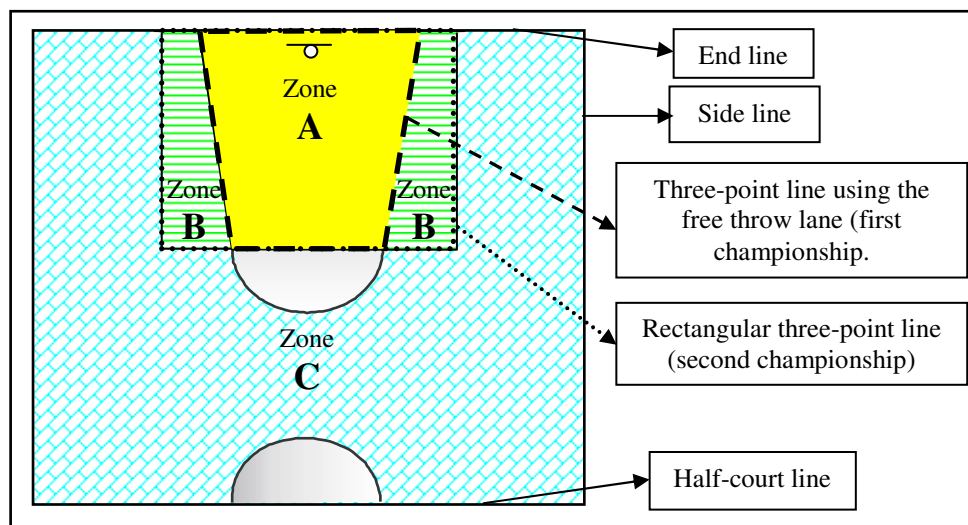


FIGURE 1: THREE-POINT LINE USING THE FREE THROW LANE AND RECTANGULAR THREE-POINT LINE.

The motor praxeology establishes that rules designate the requisites for the development of the game actions, which determine the internal logic of the sport that they regulate (Parlebas, 2001). The prescriptions set forth by the regulations define the game actions, given that the regulations establish four types of relationships that cause the motor action to emerge (Parlebas, 2001), namely: (a) between participants; (b) between the participant and the game space; (c) between the participant and the objects and/or tools that influence the contest; and (d) the mode in which the participant must adjust to the game tempo. When changing the three-point line, the game space is modified and it may also change the game actions. This requires that studies be conducted that are focused on the analysis of game actions. The game action is the fundamental aspect that is directly affected by the changes and it is expressed through observable, objective motor behaviours.

From a pedagogical perspective, rules are a didactical resource and are established to cause the desired adaptation in individuals (Rink, 1993; Pellett *et al.*, 1994; Pellett & Lox, 1998).

The modification of the practice conditions has specific objectives, namely: (a) to generate a simplified approach that is suitable for the level of the children; (b) to allow much opportunity for practice; (c) to be able to execute it successfully; and (d) to increase the enjoyment (Pellett *et al.*, 1994; Brown *et al.*, 2000; Prusak & Darst, 2000). According to Prusak and Darst (2000), small adjustments can make a tremendous impact in the learning environment. However, there are few scientific studies that analyze the rules and their modification as pedagogical variables (Weidner, 1998).

Previous studies justify the need to assess whether the objective for which a rule is modified is actually fulfilled before the objective is definitively established (Nevill *et al.*, 2008). In basketball, D'Silva *et al.* (1988) analyzed the impact of the inclusion of a three-point line on the shot in the National Championship at Calcutta. The results demonstrated that the standard shot was the most suitable for making a three-point field goal and increased the number of successful three-point field goals by the shortest players, although the shots that were close to the hoop were still the most predominant. Romanowich *et al.* (2007) studied the effect of first bringing the three-point line nearer the basket and later distancing the line in the National Basketball Association (NBA). The conclusions indicated that when bringing the three-point line nearer to the hoop, the relative frequencies of shot attempts and successful shots were increased. On the other hand, when they again distanced the line, the relative frequency of attempts, but not successful shots, decreased. In youth basketball, Andreasen (1990) analysed the effect of the inclusion of a three-point line on seven teams of 15 to 16 year-old players. The results demonstrated an increase in man-on-man defence, which allows for creating spaces and facilitating the shot from inside positions. The coaches proposed situating the three-point line nearer to the basket, but they did not specify the distance. Adams (1991) evaluated the three-point shots from the basketball team at Mountain View High School in relation to various game statistics. The results indicated that the three-point line seemed to cause the defensive players to organise themselves around this line and increased the use of man-on-man defence.

In mini-basketball, Piñar *et al.* (2002) found that the majority of shots were taken from inside the free throw lane (81%), after analysing the positions and distances during the regular season. From their results, they proposed a three-point line that was similar to the adult line and that was four meters from the hoop in order to increase the number of shots taken outside of the free throw lane, the free spaces close to the hoop and the variability of the shots taken. As far as it is known, only two studies about modifications in the mini-basketball regulations have been done in the context of competition. Piñar (2005) modified a series of rules during two championships, among which was the inclusion of a three-point line four meters from the hoop, which was similar to the adult three-point line. The purpose of Piñar's study was to increase the number of ball possessions that end in a shot, the shots from outside of the free throw lane, the lay-ups and hook shots and to offer the opportunity to try to achieve three-point shots. The results demonstrated a 17% increase in the number of successful shots, a 3.5% increase in the standard and hook shots, a 13.7% increase in ball possessions in which the ball was shot from outside the free throw lane and a 9.6% increase in ball possessions in which the ball was shot from a distance greater than four meters. However, as various modifications were included (size of the court, free throw line, player participation time and number of players taking part), it could not be determined whether the results were a consequence of the inclusion of the three-point line only, or if other modifications affected

these results. Arias *et al.* (2009) compared the two three-point lines that are studied in the current study during two championships. The results demonstrated that there was an increase in points scored, number of players taking part in the ball possession, number of passes and number of 1-on-1 situations when players utilised the three-point line delimited by the free throw lane. Although these variables would appear to be unaffected by the modification of the three-point line, the results were due to the fact that the modification affects the game dynamics. This is an effect of the interaction between the rule change and the game actions (Parlebas, 2001). However, the study of Arias *et al.* (2009) did not evaluate which of the two models should facilitate the development of situations recommended in the literature for the three-point line: (a) those that end in a shot attempt; (b) those that strengthen the shot from outside of the free throw lane; (c) those that make use of the lay-up and hook shot; and (d) those that increase the number and effectiveness of three-point shots.

The aim of this study was to compare the three-point line delimited by the free throw lane and the three-point line delimited by a rectangular area to analyze which of the two three-point line designs allows for a higher frequency of ball possessions that end in a shot, that end in a shot attempt from outside of the free throw lane, that increase the number of lay-up and hook shot attempts and that attain a higher number and effectiveness of three-point shots. The hypothesis is that with the three-point line delimited by the free throw lane, there could be a greater frequency of shot attempts from outside the free throw lane as well as three-point shot attempts and successful three-point shots, as the free throw lane is smaller than the rectangular area. The authors did not hypothesise about which three-point line would obtain a greater frequency of ball possessions that end in a shot attempt and with which there would be more lay-up and hook shot attempts, as there are no previous studies that have analysed these relationships.

METHOD

Participants

The participants of the study consisted of female players (N=67) with an average age of 10.39 years (SD=0.67) from six mini-basketball teams that played in an official competition within their province during the 2006-2007 season. The players had been competing in their sport for 2.11 (SD=0.77) years and they played 3.5 (SD=0.55) days per week for a total of 5.33 (SD=1.35) hours. The players participated in two championships. In each championship there was a total of nine games, with each team competing in three games. The sample consisted of 3,311 ball possessions, 1,642 ball possessions from the first championship and 1,669 from the second one. The sample was selected through a total sampling of the actions that took place (Anguera, 2003). The University's Institutional Ethics Review Board approved the study (CEI 22-540). Before carrying out the empirical part of the study, the players' parents and coaches provided informed consent to participate in this study.

Experimental set-up

Ten mini-basketball teams were invited to compete in two championships. From the 10 teams six were selected to participate because they had not previously practiced or competed with a three-point line. Neither the coaches nor the players knew the goal of the study. The coaches

were informed that: (a) they would play in two championships of nine games each (three games per team); (b) there would be 30 days between championships; and (c) in each championship players would use a different three-point line. Further, coaches were asked to: (a) train with the three-point line delimited by the free throw lane (see Figure 1) for four weeks before the first championship; (b) train with the three-point line delimited by the rectangular area (see Figure 1) for four weeks before the second championship; (c) hold a minimum of three one-hour practices each week; (d) remind players at the beginning of each practice that the shot attempts from behind the three-point line are worth three points; (e) continue working on the same content in each practice session and not include specific exercises to work on three-point shots; and (f) assure that the same players participated in the two championships. The principal researcher informed the coaches about the characteristics of the two championships (see Table 1) two months before the first championship. Successful shots outside zone A were worth three points in the first championship and shots outside zones A and B were worth three points in the second championship. The lane consisted of a trapezoid with a 6 meter base that runs along the baseline, a 3.6 meter free throw line at the opposite end and sides that measured 5.80 meters. The rectangular area measured 8 meters long by 4 meters wide.

TABLE 1: CHARACTERISTICS OF THE CHAMPIONSHIPS

Aspect	Characteristics
System of competition	<ul style="list-style-type: none"> - Teams were divided into two groups of three teams each. Within each group, all teams played each other and a classification was determined. Finally, teams played against the other group according to their classification (1st vs. 1st, 2nd vs. 2nd, 3rd vs. 3rd). - The match-ups were the same in the two championships. - Man-on-man defense was required. - This took place in one day, from 9AM to 6PM.
Participating players	<ul style="list-style-type: none"> - The same players had to participate in the two championships. - Teams were composed of 8-12 players. - Five players on the court at a time.
Age of players	<ul style="list-style-type: none"> - Between 9 and 11 years.
Duration of games	<ul style="list-style-type: none"> - Six periods of 8 minutes.
Rest time per game	<ul style="list-style-type: none"> - One minute between periods. - Five minutes between the 3rd and 4th periods.
Rest time between games	<ul style="list-style-type: none"> - Ten minutes.
Court dimensions	<ul style="list-style-type: none"> - 28 × 15 m.
Court placement	<ul style="list-style-type: none"> - Within the same gymnasium.
Game ball size	<ul style="list-style-type: none"> - Weight: 470-500 g., Circumference: 69-71 cm.
Basket height	<ul style="list-style-type: none"> - 2.60 m.
Referees	<ul style="list-style-type: none"> - Four.
External factors	<ul style="list-style-type: none"> - Public in the stands.

Design and procedure

Observational methodology, which is accepted as an empirical methodology for the performance sciences (Anguera & Blanco, 2003) was used through a follow-up, idiographic, multidimensional design type (Anguera, 2003).

Preparation of the observation instrument. The authors used a category system as the observation instrument (Anguera & Blanco, 2003). The process of elaborating the category system consisted of three steps. In the first step, an expert group of coaches and the researchers determined the variables to be studied following the empirical inductive strategy affected by the lack of theoretical constructs and the multidimensional character of the action (Gorospe *et al.*, 2005). In the second step, an operational definition of each variable and its categories was distinguished. This system took shape during the observer training phase. The category system was exhaustive and mutually exclusive. The categories were coded using a numeric system to facilitate its register. The category system was formed by the following variables and categories:

1. Manner of ending the ball possession: the action with which players stopped controlling the ball was registered. Adapting the categories cited by Piñar (2005) and the conditions of the shot clock, the following categories were established: (a) shot; (b) turnover; (c) steals and interceptions; (d) defensive error; and (e) referee's decision.

2. Shooting zone: the area where shots were executed in each ball possession was registered. From Piñar (2005) and Arias *et al.* (2009), the following categories were established (see Figure 1): (a) zone A; (b) zone B; and (c) zone C.

3. Type of shot: the shooting technique used in each ball possession was registered. From Piñar (2005), the following categories were established: (a) standard shot; (b) lay-up; and (c) hook shot.

4. Three-point shooting performance: the number of three-point shot attempts and the number of successful three-point shots were registered in each ball possession. The following categories were established: (a) number of three-point shot attempts; and (b) number of successful three-point shots.

Filming. Nine games were recorded within each championship with two video cameras (JVC, Everio Full HD-GZ-HD7), each one situated transversely to one of the two mini-basketball courts. The cameras were placed at a height of five meters. The recording focused on the player with the ball and the basketball hoop, while also including as much of the rest of the court as possible in the image. The three-point lines of each court were measured and put into place with 200 m of adhesive tape the night before each championship.

Preparation of the register instrument, the training manual and the instruction manual for the observers. The register instrument (Anguera & Blanco, 2003) was created from the adaptation of a Microsoft Excel 2003 worksheet (Microsoft Corporation, United States of America) to which a tool to capture and process the videos was added (Virtual Dub, v. 1.7.0.). This instrument allowed the observers to register the number corresponding to each category in the Excel sheet while likewise viewing the recording at a speed of 25 frames per second. This instrument fostered correct transcription of the data (Castellano *et al.*, 2008). To guide the observers' training process, the researchers created a training manual that described: (a) the objective of the training process; (b) basic concepts of observational methodology; (c) the stages to follow in the training process; and (d) the structure of the training sessions. An instruction manual for the observers was also created, which consisted

of: (a) the category system; (b) the coding of the categories; and (c) the process for completing the register instrument.

Observer training and obtaining the register's reliability. Four observers were trained for at least 40 hours, following the training and coaching stages suggested by Anguera (2003). Observers' performance was evaluated through reliability when compared to an expert observer. The expert observer had more than 100 hours logged in the registering of game actions as well as intra-observer reliability values between .98 and 1. To measure the reliability, the observers and the expert individually observed an 18-minute fragment of an additional game. The data they recorded were compared and the reliability was calculated utilizing the Kappa's concordance coefficient, reaching values between .90 and .98.

Data collection. Data were collected via systematic registration (Anguera & Blanco, 2003) through observation of the recorded games. Each ball possession was considered a unit of analysis. To increase the observation reliability, the protocol of observing each ball possession four times at real time was used. Each time one of the criteria to analyse was focused on. Once the corresponding category to each criterion was located, the observers again viewed the ball possession at 25 frames per second as many times as necessary to identify whether it fulfilled the key aspects that determined each category. In each observation of a ball possession, observers registered the numerical code corresponding to each criterion on which an observation was focused. Once this process was finished, the protocol was repeated with all the ball possessions.

Statistical analysis

Data were collected through a register instrument to capture, file and later treat them statistically with the Statistical Package for Social Sciences (SPSS) v.13.0. for Windows. Descriptive analyses were performed for each variable, calculating frequencies and percentages. The normality of the data through the Kolmogorov-Smirnov test was examined and according to this test the data were non-parametric. The Mann-Whitney U Test was used to determine if there were significant differences among the averages of the compared variables according to the two three-point line designs. Significance was set at $p < 0.05$.

RESULTS

As shown in Table 2, statistically significant differences between the two championships were found for ball possessions that ended in a shot ($U=1280785$, $Z=-3.827$, $p=.000$) and those that ended with a defensive error ($U=1339674.5$, $Z=-2.416$, $p=.016$). A higher percentage of ball possessions ended in shots during the first championship (62.9% vs. 56.3%), while a higher percentage of ball possessions ended with a defensive error during the second championship (6.5% vs. 8.7%). Statistically significant differences were not found for ball possessions that ended in a turnover ($U=1356561$, $Z=-.715$, $p=.474$), a steal or interception ($U=1342866.5$, $Z=-1.851$, $p=.064$), or a referee's decision ($U=1352430$, $Z=-2.851$, $p=.061$). Statistically significant differences were found between the two championships for ball possessions in which there was a shot attempt from zones A ($U=1286321$, $Z=-3.531$, $p=.000$) and C ($U=1356614$, $Z=-2.182$, $p=.029$). During the first championship, a higher percentage of ball possessions ended with a shot attempt from zones

A (56.4% vs. 50.3%) and C (2.3% vs. 1.3%). No statistically significant differences were found for shot attempts from zone B ($U=1361329$, $Z=-.900$, $p=.368$). Statistically significant differences were found between the two championships for ball possessions in which there was a standard shot attempt ($U=1294771$, $Z=-3.269$, $p=.001$) or a hook shot attempt ($U=1358526$, $Z=-3.176$, $p=.001$). During the first championship, there was a higher percentage of ball possessions in which a standard shot (40.5% vs. 35%) or a hook shot (1% vs. 0.2%) was attempted. There were statistically significant differences between the two championships for ball possessions in which there was a three-point field goal attempt ($U=1314902$, $Z=-6.600$, $p=.000$), as well as a successful three-point field goal ($U=1355201$, $Z=-3.888$, $p=.000$). In the first championship, there was a higher percentage of ball possessions in which there was a three-point field goal attempt (6.4% vs. 1.3%) and a successful three-point field goal (1.2% vs. 0.1%).

TABLE 2: FREQUENCIES, PERCENTAGES AND SIGNIFICANT DIFFERENCES OF THE MEANS OF THE COMPARED VARIABLES ACCORDING TO THE TWO THREE-POINT LINE DESIGN

Variables	Categories	Championship			
		First: free throw lane		Second: rectangular area	
		n	%	n	%
Manner of ending the ball possession	Shot.***	1032	62.9	941	56.3
	Turnover.	324	19.7	346	20.7
	Steal or interception.	161	9.8	196	11.8
	Defensive error.**	107	6.5	146	8.7
	Referee's decision.	018	1.1	40	2.4
Shooting zone	Zone A.***	926	56.4	838	50.3
	Zone B.	069	4.2	81	4.9
	Zone C.*	037	2.3	22	1.3
	Standard.***	665	40.5	584	35
Type of shot	Lay-up.	350	21.3	354	21.2
	Hook.***	017	1	3	0.2
Three-point shooting performance	Three-point shot attempts.***	106	6.4	22	1.3
	Successful three-point shots.***	020	1.2	2	0.1

Note. *($p < .05$); **($p \leq .01$); ***($p \leq .001$)

DISCUSSION

The aim of this study was to compare the three-point line delimited by the free throw lane and the three-point line delimited by a rectangular area to analyse which of the two three-point line designs allows for a higher frequency of ball possessions that end in a shot, that end in a shot attempt from outside of the free throw lane, that increase the number of lay-up and hook shot attempts and that attain a higher number and effectiveness of three-point shots. The percentage of ball possessions that ended in a shot attempt, in a shot attempt from zone A or C, a standard or hook shot and both three-point field goal attempts and successful three-point field goals increased when participants used the three-point line delimited by the free throw lane. The frequency of shot attempts from outside the free throw lane and of lay-ups was not different between the two designs that were studied. This demonstrates that the three-point

line with which participants played in the first championship better facilitated the playing and enjoyment of the youth participants in accordance with their capabilities (Piñar *et al.*, 2002/2003; Piñar, 2005; Arias *et al.*, 2009), which according to the literature should foster an increase in the perceived competence (Hassandra *et al.*, 2003) in fun and enjoyment (MacPhail *et al.*, 2008) and in self-efficacy (Bandura, 1977; Chase *et al.*, 1994). The predominance of these motives should allow for greater adherence to mini-basketball specifically and to sport participation in general (Hassandra *et al.*, 2003; Weiss & Williams, 2004; Xiang *et al.*, 2004).

The primary goal of a mini-basketball game is to score or make baskets as with other team ball sports. This does not mean that the other motor skills are not necessary, but rather that the other motor skills are done to facilitate making baskets. Therefore, the shot should be the motor skill that finishes most ball possessions in mini-basketball (Piñar, 2005). In the first championship, 6.6% more ball possessions ended in a shot. This situation is ideal in mini-basketball because the shot is one of the most motivating motor actions (Prusak, 1997; Vollmer & Bourret, 2000; Palao *et al.*, 2008). The data with regard to ball possessions that end in shots from the current study were higher than those found by Piñar (2005) in girls' mini-basketball. Piñar (2005) found that 24.1% of the possessions in 5-on-5 ended in a shot compared to 29.1% in 3-on-3. Also, 2.2% more ball possessions ended with a defensive error (violation and personal foul) in the second championship. In general, 5.2% more ball possessions ended in a negative action (turnover, steal/interception, or defensive error) in the second championship. The players ended more possessions with errors in the second championship, which could have been due to the inclusion of a three-point line that is not well-adapted to the development of the players, as inferred in the literature (Piñar, 2005; Arias *et al.*, 2009). The fact that the rectangular three-point line was so far from the hoop and the organisation that teams adopt in offense and defence, in relation to the three-point line, seemed to produce an adverse effect on the actions of the players. Nonetheless, this result requires future study to discover whether the inclusion of a three-point line affects the spatial perception of offense and defence.

According to Miller and Bartlett (1996) and Liu and Burton (1999), shooting distance is the first factor that affects shooting accuracy and form. The analysis of the shooting distance contributes useful information for improving youth development. In accordance with Liu and Burton (1999), it is necessary to know the critical distance to the hoop where the number of shots, the precision and the form are affected or impaired. The number of shot attempts from zone A was higher in the first championship. This could be due to a placement of the defence, such that it permitted more space inside the free throw lane (D'Silva *et al.*, 1988; Andreasen, 1990; Adams, 1991; Piñar, 2005; Arias *et al.*, 2009). D'Silva *et al.* (1988) argue that in spite of the increase in the three-point shots, the shots closer to the hoop still predominated after the inclusion of the three-point line. The shots that are close to the hoop predominate because of their greater effectiveness in basketball (Tsitskaris *et al.*, 2002; Tavares & Gomes, 2003; Mexas *et al.*, 2005). The number of shots attempted from outside the free throw lane was similar in the two championships. The number of shot attempts was similar from zone B and greater from zone C in the first championship. This result could be surprising because the value of the shots from zones B and C in the first championship was three points and in the second championship only the shots from zone C had a value of three points; thus, it seems logical that there should have been an increase in the number of shots from zone B in the first

championship, since it was closer to the hoop. From the results of a study by Adams (1991), it was found that defenders seemed to organise themselves around this line. This result seems to be related to the placement of the offense and defence in zone B in the first championship, which would limit the shots from this zone. In the second championship, the offensive and defensive organisation in zone C would have predominated, which would have reduced the number of shots from this zone. However, this should be tested in future studies by analysing the placement of the offense and defence and asking those on offense about their shot decisions. Piñar *et al.* (2002) observed that 81% of shots were attempted from inside the restricted area when playing without a three-point line in boys' mini-basketball. Piñar *et al.* (2003) likewise obtained a value of 69.5% without a three-point line in boys' mini-basketball. For girls' mini-basketball, Piñar (2005) reported that 71.6% of shots were attempted from inside the restricted area for the 5-on-5 modality when playing without a three-point line, compared to 54.7% for the 3-on-3 modality when playing with a three-point line. As confirmed by previous studies when introducing a three-point line, the number of shots attempted from distances greater than the restricted area increase (Piñar, 2005), but in the present study the shot percentages were not as high as reported in the literature. This could be due to the series of modifications introduced by Piñar (2005). It seems that it is necessary to analyse other modifications in the regulations in order to increase the number of shots from outside the free throw lane.

Because of its special importance as a specific motor action with which the rest of the actions and tactical resources are completed and because of its direct relationship with the goal of the game, it is important to know the kind of shots that player's attempt (Tsitskaris *et al.*, 2002; Ibáñez *et al.*, 2009). The participants mostly used the standard shot in the first championship. The higher number of standard shots in the first championship was due to the greater number of shot attempts from zones A and C. In zone A, the standard shot increased because the presence of close opponents requires increasing the angle and release height of the ball and this is achieved with the standard jump shot (Rojas *et al.*, 2000). The shots from zone C were standard because the increase in the distance with regard to the hoop brings about an increase in the speed of ball release (Elliott, 1992; Miller & Bartlett, 1996). This causes the players with less strength to increase their horizontal displacement in order to generate the necessary speed to allow the ball to reach the hoop (Elliott, 1992; Miller & Bartlett, 1996; Liu & Burton, 1999). D'Silva *et al.* (1988) also found that the standard shot was the shot that was most utilised for attempting three-point field goals. The hook shot was the other type of shot that was most used in the first championship from zone A. In mini-basketball, the hook shot is suggested for positions that are close to the hoop and with defenders that are very close, since it is used to protect the ball. However, it is not utilised much due to the difficulty that its execution involves (Ibáñez *et al.*, 2009). Piñar (2005), after including the three-point line, found a 3.5% increase in standard and hook shots. In the present study, the first championship had an increase of 6.3%. The increase in the number of hook shots means that the participants had the opportunity to practice a type of shot that is not used much. The standard shot was the type of shot that was most used, followed by the lay-up and the hook shot in both championships. This shot pattern is common in basketball (Tsitskaris *et al.*, 2002; Ibáñez *et al.*, 2009). Ibáñez *et al.* (2009) analysed 8,471 shots from the NBA and found that 62.7% were standard shots, 19.1% were lay-ups and 5.9% were hook shots. Tsitskaris *et al.* (2002) found that for shots taken in the Green national leagues, 49.2% were standard shots and 14.4% were lay-ups. However, working on variability of shot type is necessary in youth

basketball (Tsitskaris *et al.*, 2002; Piñar, 2005). Variability fosters the learning of a considerable number of types of shots, which contribute to the development of an adaptable cognitive-motor system in this regard (Memmert & Roth, 2007). More analytical studies should allow us to know how the type of shot is modified in regard to the increased distance and zone (frontal or lateral) with regard to the hoop in mini-basketball.

In mini-basketball, the study by Arias *et al.* (2009) analysed the influence of simply including a three-point line on various motor actions during the game. In addition to this study, there are others that demonstrate the importance of including a three-point line with regard to the practice of motor actions that are better adapted to the capabilities of the players during the game (Piñar, 2005; Arias *et al.*, 2008). Participants made 6.3% more three-point shot attempts in the first championship. This aspect is especially important as noted by Piñar (2005) and Arias *et al.* (2009) because an increase in the amount of practice can aid in learning and development. Participants made 1.1% more three-point shots in the first championship. This coincides with the fact that a greater number of three-point shot attempts allows for more successful three-point shots (Romanowich *et al.*, 2007). Arias *et al.* (2009) also found that the participants achieved a higher percentage of ball possessions in which they made a successful three-point field goal (1.1%) when playing with a three-point line delimited by the free throw lane. Therefore, in the first championship the possibilities to attempt and score a three-point shot were more suitable for the capacities of the players. This would contribute to the increase in the levels of perceived self-efficacy (Bandura, 1977; Chase *et al.*, 1994), which likewise reflects on motivation (Bandura, 1977; Chase, 2001). Piñar (2005), when including a three-point line in the 3-on-3 modality that was similar to the adult three-point line, but at four meters from the hoop, found that the girls achieved a successful three-point basket in 4% of the ball possessions for a total of nine baskets. For male players, this happened in 13.9% of possessions, which were a total of 36 baskets. In the present study, when playing with the three-point line delimited by the restricted area, players only made three-point baskets in 1.2% of ball possessions, which comprised 20 baskets. As it is necessary for mini-basketball players to practice shooting from distances greater than that which delimits the restricted area without hurting their precision and form, it is necessary for future studies to assess the optimal distance from the basket to place the three-point line as well as studying other aspects that facilitate successful three-point baskets. Participants took successful three-point shots from zone B, 60% of the time and from zone C, 40% of the time in the first championship. The only two successful three-point shots were attempted from zone C in the second championship. However, if in this championship, shots from zone B had been worth three points, 17 more would have been made. The reduction in the distance from the basket to the three-point line in the first championship had a favourable effect on the effectiveness of the three-point shot. Given that zone B is between 2.87 and 5.65 meters from the basket, it seemed that the three-point line should be situated between these distances for the participants of this study.

In conclusion, the current study provides evidence of the effect of two three-point line designs on variables that are directly related to the shot, an area in which there is a lack of information. The results demonstrated that when girls play with the three-point line delimited by the free throw lane, there is an increase in the frequency of ball possessions in which the players: (a) finish with a shot attempt; (b) shoot from inside the free throw lane and from a distance of between 4 and 5.65 meters; (c) attempt a standard or hook shot; and (d) attempt

and score a three-point shot. This study confirms the necessity of consulting with analysts before introducing and modifying a rule in sport (Weidner, 1998; Nevill *et al.*, 2008). Administrators of youth sport have little data for designing competitions and adapting them to game regulations (Weidner, 1998; Bergeron, 2007). The current study provides useful information as an example of analysis of the regulation modification before its definitive inclusion in athletic competition, especially in youth sport. These results may serve as the basis for studies that analyse physiological and psychological variables as well as variables related to the learning and motor development of the children that play mini-basketball in real game-like situations.

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