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ORIGINAL

COOPERATIVE GAMES AND INCLUSION IN PHYSICAL EDUCATION

JUEGOS COOPERATIVOS E INCLUSIÓN EN EDUCACIÓN FÍSICA

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ABSTRACT

Based on the theoretical principles of motor praxeology this study examined four types of cooperative motor behaviours, namely well-matched [WMAT], mismatched [MISMAT], destructive [DEST] and cooperative agreement (PACT), among 40 children aged 8-11 years (18 children with disabilities and 22 without disabilities) who were taking part in a workshop designed to promote inclusion through cooperative games. The most commonly observed motor behaviour (24%) was WMAT. Multiple regression models showed that the dependent variables had considerable explanatory power: WMAT, 34%; MISMAT, 22%; DEST, 30%; and PACT 3%. With respect to the independent variables analysed, namely age, gender and whether or not the child had disabilities, only the latter explained some of the observed behaviour.

KEY WORDS*:* cooperation, games, inclusion, motor behaviour.

RESUMEN

De acuerdo con los principios teóricos de la praxeología motriz este estudio examinó cuatro tipos de conductas motrices cooperativas: ajustadas [AJUS], desajustadas [DESAJ], perversas [PER]) y de pacto (PACT) de 40 niños (18 con discapacidades and 22 sin discapacidades) de 8-11 años que participaron en un programa diseñado para promover la inclusión a través de juegos cooperativos. Las conductas motrices más frecuentes (24%) fueron las AJUS. Modelos de regresión múltiple mostraron que las variables dependientes tuvieron un considerable poder de explicación: AJUS, 34%; DESAJ, el 22%; PERV, 30% y 3% PACT. Con respecto a las variables independientes analizadas, es decir, la edad, el género y si la persona tenía discapacidad, sólo esta última explicó algunas de las conductas observadas.

PALABRAS CLAVE*:* cooperación, juegos, inclusión, conducta motriz.

INTRODUCTION

As we enter the second decade of the twenty-first century, inclusion remains a central issue for the field of physical education (PE) and poses a genuine challenge for PE teachers (e.g. Block, 1998; Block & Obrusnikova, 2007; Díaz del Cueto, 2009; Dyson & Grineski, 2001; Egilson & Traustadottir, 2009; Prieto, 2009). In this context, cooperative learning can be an excellent way of fostering inclusion. Indeed, numerous studies have shown that cooperation favours the overall development of schoolchildren (e.g. Putnam, 1988; Garaigordobil, 1995; Johnson & Johnson, 1989; Lavega, 2009; Lavega et al., 2011; Hromek, 2004; Hromek & Roffey, 2009; Orlick, 1981; Rooffey, 2006). However, when a PE teacher proposes to use a certain type of game or motor activity it is essential that the motor tasks involved are adapted to the needs of each student. To this end, it is necessary to identify the internal logic that governs these tasks (Ruiz, 1994). Merely by revealing the grammar or internal logic of motor scenarios it is possible to understand their properties, to predict their possible effects and, therefore, to modify or adapt them as necessary (Collard, Oboeuf, & Ahmaidi, 2007; Lagardera & Lavega, 2003; Oboeuf, Collard, & Gerard, 2008). In this regard, the notion of motor praxeology (Parlebas, 2001) provides a solid epistemological basis on which to develop this scientific knowledge in relation to games, sport or motor contexts. The aim of such an approach is to analyse and identify the key features that characterise any

situation involving motor behaviour. Accordingly, any game can be thought of as a praxeological system (Lagardera & Lavega, 2003), one with an internal logic that imposes a system of obligations and relationships (Etxebeste, 2001). Parlebas states that the internal logic constitutes "the system of pertinent features of a motor context and of the consequences it entails in terms of performing the corresponding motor action" (Parlebas, 2001, p. 302).

In 2005, and based on this theoretical framework, we began a research project that comprised two stages: the first aimed to reveal the internal logic of cooperative games, while the second sought to develop a catalogue of motor behaviours (Lavega, 2009). In order to understand the meaning of this catalogue it is first necessary to understand the concept of motor behaviour (Parlebas, 2001). According to the theory of motor praxeology the person who takes part in a game is an actor who interprets his/her own internal laws (the internal logic), and this leads to the production of individualised motor actions, i.e. motor behaviours. When faced with the same conditions or set of game rules each person acts in a different way, adapting his/her response in a characteristic manner to the internal logic of the game and thereby producing singular motor behaviours. Motor behaviour should thus be understood as "the meaningful organisation of a person's motor actions" (Parlebas, 2001, p. 85). A further point is that individuals act in a unitary way with the whole of their personality, putting into practice their different biological, affective, cognitive and relational dimensions.

The catalogue of motor behaviours was developed by considering the social dimension of cooperative motor behaviours, in other words, the various responses shown by each participant were considered according to how he or she related to other participants in the context of cooperation. The catalogue was subsequently applied and validated in a group of individuals with learning disabilities (Terreros & Lavega, 2008). The units of which the catalogue was comprised can be regarded as molar, that is, they were relatively broad in scope (Anguera et al., 1993). Participants in this phase of the research were 44 students (mean age 9.31 years, SD = 1.34, range 8-11) from a school in Lleida (Spain) who took part in 20 cooperative games. The response levels and the unit were established according to the basic criteria corresponding to the internal logic of each game, that is, the relationship between a given player and the other participants, the playing space, the material used and time (Parlebas, 2001). All the categories were mutually exclusive and the games were registered using the software Match Vision Studio Premium (Castellano, Perea, & Alday, 2005). Intra-observer agreement (reliability) was assessed by calculating the kappa index (two independent observations by the same observer over a two-month interval). A random number generator program was used to select 20 games (30% of all the registers) for the second round of observation. Application of the ComKappa software yielded an intra-observer kappa coefficient ≥92%.

The following description of the *Knot* game provides a practical illustration of the above catalogue (Table 1). In this game, players are assigned to groups of eight and are asked to grasp another player (randomly) with each hand. They will have thus formed a knot between themselves, the task being to undo it and form a circle but without releasing their grip. Subsequently, two players are asked to put on a blindfold before playing the game again. The catalogue groups cooperative behaviours into four dimensions: 1) well-matched motor behaviours (WMAT); 2) mismatched motor behaviours (MISMAT); 3) destructive motor behaviours (DEST); and 4) verbal behaviours associated with the pact made (PACT).

1. Well-matched cooperative motor behaviours (WMAT): responses that match the cooperative demands of the game's internal logic.

1.1WMAT-1: Fostering cooperation. There is a desire to foster the cooperation requested at the outset; 1.2 WMAT-2: Making sacrifices. Taking part in the interaction implies a response that is awkward or even unpleasant for the protagonist, who performs it in order to favour the team's success; 1.3 WMAT-3: Proposing effective forms of cooperation. In games with more than one player in a role this occurs when the player who is leading the group proposes ways of cooperating that the others can follow; 1.4 WMAT-4: Cooperating effectively. Those responses in which the cooperation performed has no highly unusual features.

2. Mismatched cooperative motor behaviours (MISMAT): interactions that deviate from the cooperative communication that is required by the game's internal logic. Six categories have been identified:

2.1 MISMAT-1: Cooperating ineffectively. The individual repeatedly produces incorrect motor responses; this behaviour may be due to the protagonists having agreed an intervention that is too difficult or to a lack of ability as regards performing the motor actions; 2.2 MISMAT-2: Seeking competition. Although the rules do not require any competition the protagonist's motor behaviour shows a wish to compete with the others, comparing the result of his/her interventions with those of other groups or teammates; 2.3 MISMAT-3: Proposing forms of cooperation that are too demanding. In games where more than one player is in role, the protagonist proposes highly challenging actions for the others to perform; 2.4 MISMAT-4: Hindering cooperation. Making it difficult for one or more teammates to cooperate in the game.

3. Destructive or undisciplined motor behaviours (DEST): responses that imply a failure to abide by the agreed rules. Two categories have been identified:

3.1 DEST-1: Not playing by the rules. Performing any action that is not allowed by the rules of the game; 3.2 DEST-2: Causing distress. Interacting negatively with another person through motor actions (hitting, pushing, etc.) that do not form part of the game.

4. Verbal pact behaviours (PACT): these are responses made prior to performing any motor behaviour in the game. The research identified two well-matched behaviours (PACT-WMAT) and two mismatched ones (PACT-MISMAT).

4.1 PACT-WMAT-1: Proposing a pact. The individual initiates the pact and suggests to teammates a way of resolving the problem at hand;
4.2 PACT-WMAT-2: Accepting the pact. The individual seconds the pact initiated by another person;
4.3 PACT-MISMAT-1: Rejecting the pact. The individual intervenes without any wish to reach an agreement with the others, showing no willingness to enter into dialogue.

Table 1. Description of cooperative motor behaviours in the Knot game

Game 1. The Knot		Player in the blind role	Player in the sighted role
Well-matched motor behaviours (WMAT)	Fostering cooperation	Players who cannot see are unable to perform this motor action.	Shifting the position of the arms (up or down) and giving verbal instructions on how to do it so as to favour the change of position among the others, especially those who cannot see.
	Making sacrifices	Bending the arm joints in a way that it is very uncomfortable, twisting oneself, pushing oneself as much as possible so as to help what the others are doing.	Same as for the player in the blind role.
	Proposing effective forms of cooperation	Players who are blindfolded are unable to give instructions to the others, and therefore they can't perform this motor behaviour.	Asking the other players to change position but giving them instructions all the time so that they can follow one another. After changing position, carefully taking the hand of one of the blindfolded players and gently and patiently accompanying his/her actions.
	Cooperating effectively	Changing the position of the hands without making any highly unusual movement.	Always acting without letting go of one's grip, without making any highly unusual movement.
Mismatched motor behaviours (MISMAT)	Cooperating ineffectively	Failing to produce effective actions; moving but letting go and then gripping again.	Same as for the player in the blind role.
	Seeking competition	Showing signs of wanting to perform actions quickly so as to undo the knot before other groups manage it; shouting out things like "we've won!"	Same as for the player in the blind role.
	Proposing forms of cooperation that are too demanding	Players who are blindfolded are unable to give instructions to the others as they can't see.	Telling the blindfolded players to move very quickly, dragging them from one place to another without allowing them time to know what they have to do.
	Hindering	Gripping another player very gently so that the grip is constantly being lost, or failing to move when a neighbouring teammate performs a motor action.	Gripping another player very gently so that the grip is constantly being lost, being too far away from neighbouring players so that it is difficult for them to carry out their actions, or moving so quickly that it is impossible to follow the teammate who is giving his/her hand.

Destructive motor behaviours (DEST)	Not following the rules	Repeatedly letting go with one or both hands of the neighbouring player(s), constantly removing the blindfold so as to see.	Repeatedly letting go with one or both hands of the neighbouring player(s).
	Causing distress	Having undone the knot, or before starting the game, pushing, kicking or hitting another player from the same or another team.	Same as for the player in the blind role.
Pact behaviours (PACT) (This always implies an interruption to the game and making a proposal about the situation.)	Proposing a pact	Before starting to do something, proposing how to undo the knot.	Same as for the player in the blind role.
	Accepting the pact	Agreeing with or adding to the proposal made by a teammate, taking an active part in the pact.	Same as for the player in the blind role.
	4.3 Rejecting the pact	Disagreeing with what a teammate proposes and refusing to do it or beginning the game or the stage of the game again.	Same as for the player in the blind role.

The general aim of the present study was to use the above catalogue of cooperative motor behaviours to interpret the interactive process followed by each of the children taking part in a workshop designed to promote inclusion through cooperative games. In relation to this general aim the following two study objectives were established: 1) To observe the extent to which children with special needs interact using each of the four kinds of cooperative behaviours (well-matched, mismatched, destructive and pact behaviours), this being compared to the findings for pupils without special needs; and 2) To determine whether having special needs and the age and gender of pupils are variables that could explain the cooperative behaviours performed.

MATERIAL AND METHODS

Participants

Participants were 120 schoolchildren aged between 8 and 11 years (*M* = 9.67; *SD* = 1.46). Of these, 30 had special needs and were recruited from four special schools, while the remaining 90 children had no special needs and were drawn from two ordinary schools. For the present research we studied the cooperative motor behaviour of 40 participants chosen at random, there being 18 with special needs: 10 with a learning disability, 2 with a behavioural disability, 1 with sensory impairment, 1 with cerebral palsy, 2 children in wheelchairs, and 2 with both intellectual and motor impairment (mean age = 10.04, *SD* = 1.66). Cooperative motor behaviour was studied both among these 18 students, as well as among the remaining 22 students who did not have special needs (mean age = 9.98, *SD* = 1.46). As regards gender, the sample included 28 boys (70%), 12 of whom had special needs, and 12 girls (30%), 6 of whom had special needs.

The parents of all the participants gave their consent for their children to be video-recorded while taking part in the workshop.

Organisation of the games

The cooperation workshop lasted 1.5 hours and took place on a basketball court which was divided into six zones. Each zone was used by one group of participants, comprising five children with special needs and 15 without special needs from different schools; in this way the interaction between the children would enable inclusion and the carrying out of shared decision-making tasks (Lieberman, James, & Ludwa, 2004). In addition, a peer tutor was assigned to each zone and intervened whenever necessary, offering help to any of the children with special needs. Each zone also included two monitors whose job it was to explain the game to the children and get them started in playing it. Whenever necessary, the monitors would answer any queries, correct any misunderstandings over the rules, or even help any children who had difficulties with the motor tasks. In each zone there were also six or seven observers whose task was to identify, in their zone, the cooperative behaviours of the children with special needs and of one randomly-chosen child without special needs.

Seven cooperative games were chosen to be played: 1.*The Knot*. Players hold hands at random until they have formed a knot. Two players are then blindfolded. The task is to undo the knot and form a circle, but without letting go with one's hands at any point; 2. *Shepherd and Sheep*. One player, the shepherd, moves around the playing area with his arms crossed; the other players, the sheep, must remain in front of the shepherd, respecting always their position in this regard, as if they were a flock of sheep; 3. *Body Parts.* Players must move from one place to another while all joined together at the part of the body indicated for each game; 4. *Simultaneous Pass.* Having formed a circle each player throws a ball to another player, who must catch it and throw it on, with play continuing until the ball returns to the first player. The same route is then repeated but with faster passes; 5. *Line.* Without crossing a line, players have to change places so as to get into a certain order (e.g. arranged by height, the colour of their T-shirts, etc.). When moving, players can help and hold on to one another to avoid crossing the line; 6. *Spider's Web*. Half of the players take some elastic bands and form a spider's web. With the help of their teammates the remaining players have to pass from one side of the web to the other; 7.*The Parachute.* Players have to move the parachute, making synchronised actions such as raising and lowering the parachute, everybody moving at the same time, or moving a ball over the top of the parachute, etc. One of the first six games was played in each zone. After eight minutes the game was changed, although the players remained in their zone with the same monitors and observers.

Manual for identifying the cooperative motor behaviours

The observation manual that was drawn up included a description of the possible motor behaviours which could occur during each of the cooperative games, this being done in line with the catalogue described above (Lagardera & Lavega, 2009). When a game such as the *Knot* involved two roles the possible motor behaviours were described for both of these roles (see Table 1). The maximum number of motor behaviours possible in the seven games listed above was as follows: 52 well-matched behaviours, 53 mismatched behaviours, 18 destructive behaviours and 33 verbal behaviours associated with the pact.

Training the observers

The observers were 64 undergraduates from the degree course in Physical Activity and Sports Sciences at the INEFC-University of Lleida. They all received intensive training (20 hours) in how to observe cooperative motor behaviours. This training course assessed their observational skills using 28 video recordings of situations occurring in the same cooperative games that were to be studied subsequently in the present research. The results obtained by the undergraduate observers were compared with those of an expert (a 'gold standard' lecturer) and yielded the following Kappa indices: 56 observers K ≥ 80% and 11 observers K = 77%.
The observers used in the present study were the 40 undergraduates who obtained the best results in this training course. The remaining 24 took part as follows: 12 acted as monitors (two per zone) and 12 were responsible for the audio-visual recordings (two per zone). One week prior to conducting the present study, each of the games underwent a trial run in order to resolve any queries regarding how they worked, their organisation, or the observation of motor behaviours.

Measures

The 40 observers used a recording sheet to identify, for each of the seven games, the different cooperative motor behaviours included in the catalogue. Six or seven observers were assigned to each zone. Thirty undergraduates observed the cooperative behaviours of all the children with special needs, while the remaining ten observed the children without special needs (chosen at random). The recording sheet included a section for qualitative observations regarding the players' interventions, which could include comments about any interventions made by a peer tutor of the observed child, or by the game's monitors if they intervened with respect to the child being observed. At the end of the observations all the undergraduates had to present a written evaluation of their experience. All the games were recorded with video and photographic cameras so that the 40 observers could confirm the data in the event of any queries. Data analysis involved the computing of descriptive statistics, one-way analysis of variance, the computing of correlations and multiple regression analysis.

RESULTS

Descriptive statistics

In terms of gender, the sample comprised 12 girls (30%) and 28 boys (70%). With regard to disabilities, 22 (55%) of the 40 children had special needs. Table 2 shows the descriptive statistics for the quantitative variables.

Table 2. Statistics corresponding to the quantitative variables

	n	M	SD	95% CI	
				LL	UL
Well-matched motor behaviour	40	12.47 (24%)	8.90	0	44
Mismatched motor behaviour	40	4.93 (9%)	4.12	0	15
Destructive motor behaviour	40	1.10 (6%)	1.78	0	6
Verbal pact behaviours	40	2.38 (8%)	2.34	0	8
Age (years)	40	9.98	1.467		13

Note. CI = confidence interval; LL = lower limit; UL = upper limit.

Gender and special needs among the participants

There were no significant differences between boys and girls for the various types of cooperative motor behaviour: WMAT, $F(1, 38) = .032$, $p = .86$; MISMAT, $F(1, 38) = 1.407$, $p = .243$; DEST, $F(1, 38) = .657$, $p = .423$; PACT, $F(1, 38) = .048$, $p = .828$. However, the Welch statistic, applied as a test of homogeneity of variance, revealed statistically significant differences between children with and without special needs (SN) in relation to the following behaviours: (a) WMAT *Welch*$(1, 34.178)^{*}$, $p < .0005$; no SN: $M = 33\%$, with SN: $M = 13\%$; (b) MISMAT *Welch* $(1, 26.626)^{*}$, $p = .031$; no SN: $M = 7\%$, with SN: M = 13%; and (c) DEST *Welch*$(1, 21.143)^{*}$, $p = .007$; no SN: $M = 2\%$, with SN: $M = 11\%$.

Correlations between all the variables

As can be seen in Table 3 there was a moderate and inverse correlation between well-matched and mismatched motor behaviours, and a moderate and positive correlation between mismatched and destructive behaviours. As regards age, there was a weak and positive correlation between this variable and both well-matched and mismatched motor behaviours.

Table 3. Correlations between all the variables

	Age	WMAT	MISMAT	DEST
WMAT	-.206			
MISMAT	.315*	-.529**		
DEST	.376*	-.301	.647**	
PACT	.168	-.055	.160	-.015

Note. WMAT = well-matched motor behaviours; MISMAT = mismatched motor behaviours; DEST = destructive motor behaviours; PACT = verbal behaviours associated with the pact. * $p < 0.05$; ** $p < 0.01$

Results of the multiple regression

All three efficacy variables (gender, age and the presence of special needs) were simultaneously entered as predictors into four regression analyses. The results are shown in Table 4. The analysis revealed that the dependent variable WMAT explained 34% of the variance ($F(3, 36) = 6.173$, $p = .002$; $R = .583$, $R^2 = .340$), while the presence of special needs was shown to make a significant contribution (with SN: $M = 13\%$, no SN: $M = 33\%$; 95% CI [10, 29]). The dependent variable MISMAT explained

22% of the variance ($F(3, 36) = 3.415$, $p = .028$; $R = .471$, $R^2 = .222$). None of the individual standardised beta weights were significant. Once again, however, the presence of special needs had a significant effect (with SN: $M = 13\%$, no SN: $M = 7\%$; 95% CI [0.1, 10]).

The dependent variable DEST explained 30% of the variance ($F(3, 36) = 5.243$, $p = .004$; $R = .551$, $R^2 = .304$) and the presence of special needs was again shown to be a significant factor (with SN: $M = 11\%$, no SN: $M = 2\%$; 95% CI [2, 14]). Finally, the dependent variable PACT explained 3% of the variance ($F(3, 36) = 0.382$, $p = .766$; $R = .176$, $R^2 = .031$). None of the individual standardised beta weights were significant.

Table 4. Results of the multiple regression analysis

Well-matched motor behaviours (WMAT)			
Variable	β	T	Sig.
Gender	-.005	-0.033	.974
Age	-.059	-0.419	.678
SN	-.565	-4.013	<.0005*
Mismatched motor behaviours (MISMAT)			
Variable	β	T	Sig.
Gender	.196	1.323	.194
Age	.220	1.439	.159
SN	.318	2.081	.045*
Destructive motor behaviours (DEST)			
Variable	β	T	Sig.
Gender	.140	1.00	.323
Age	.262	1.81	.078
SN	.404	2.80	.008*
Verbal behaviours associated with the pact (PACT)			
Variable	β	T	Sig.
Gender	-.048	-0.29	.772
Age	.177	1.04	.306
SN	-.022	-0.13	.898

Note. SN = children with special needs. * Significant at p < .10

Discussion

The overall aim of this research was to study the communicative interactions of participants using a catalogue of motor behaviours that was developed in accordance with the tenets of motor praxeology. The results confirmed that the catalogue was able to provide a detailed description of the cooperative behaviours produced by the children observed, thereby enabling the interpretation of trends in their interaction with one another.

With respect to the first specific objective the descriptive analysis showed that well-matched motor behaviours (24%) were the most commonly observed, with none of the other behaviour types exceeding a frequency of 10%. The persistent engagement in this type of behaviour meant that the students had social learning experiences related to self-awareness, self-esteem, tolerance and the understanding of others (Lieberman, James, & Ludwa, 2004; Block & Obrusnikova, 2007; Egilson & Traustadottir, 2009). As regards the presence of special needs the results revealed significant differences between the two broad groups: children without special needs produced more well-

matched motor behaviours and a lower percentage of both mismatched and destructive behaviours. The group of children with special needs showed a similar rate for all three of these motor behaviours (around 12%). The study also demonstrated that the children without special needs were able to make a socio-affective commitment to the interactive tasks, despite not having previously received any specific, continuous education in cooperation.

With regard to the second study objective the beta coefficients corresponding to WMAT, MISMAT and DEST showed that the presence or absence of special needs was the explanatory factor with the greatest influence on the type of cooperative motor behaviour produced. In the case of WMAT the beta coefficient for special needs was ten-fold higher than the corresponding coefficients for age or gender. The same coefficient was also higher than those of age and gender in the case of MISMAT and DEST, although its explanatory power here was weaker. Despite these differences in the kinds of motor behaviour produced by the two groups of children, the results showed that all the participants were able to interact actively and positively with the others.

As regards the age variable, the responses of participants were similar for all the motor behaviours. However, the analysis revealed that age was an explanatory variable (albeit non-significant) with respect to the verbal pact behaviours (beta = .177, p = .306). Specifically, children who were almost eleven years old took a more active part in drawing up the rules. These findings are consistent with those of other studies about developmental differences in the complex process of using and understanding the rules of games (e.g. Linaza & Maldonado, 1987; Parlebas, 2001; Piaget, 1965). In general, this process is not complete until the age of eleven, when the child is able to participate in the coding and regulation of rules through understanding and fully accepting the group agreement.

With respect to the gender variable there were no differences between the cooperative behaviours of boys and girls. Hence, the cooperative games used here can be regarded as gender neutral. Given that both boys and girls faced the same difficulties and choices when attempting to succeed in the games it is not surprising that they produced similar behaviours (Blández, Fernández, & Sierra, 2007; Bramham, 2003; Knoppers & Elling, 2001). Furthermore, the games used did not reproduce social models associated with men and women (McKay, Messner, & Sabo, 2000; Puig, 2000), and therefore they encouraged the learning of equal relationships (Puig, 2000; Wright, 1999).

The multiple regression models showed that the dependent variables had high percentages of explanatory power: WMAT 34%, MISMAT 22% and DEST 30%. As the verbal pact behaviours are of a different nature they are governed by other factors which were not recorded here.

Conclusions

The present study showed that all the participants were able to actively perform well-matched motor behaviours. Furthermore, the internal logic of the games led the children without special needs to interact positively with their special needs counterparts; indeed, the games seemed to function as a laboratory in which social and inclusive relationships were produced among all the participants (Arias, Argudo, & Alonso, 2011; Gonçalves et al., 2010; Lavega et al., 2011). Nevertheless, differences

were observed between children with and without special needs, thereby highlighting the importance of implementing strategies that can help the former to increase their participation in the repertoire of well-matched motor behaviours.

Studies such as the present one help to improve our understanding of the pedagogical potential of cooperative games as a means of promoting inclusion through physical education. Furthermore, the study provides tools that can be applied to the real contexts in which physical education classes take place. In this regard it should be noted that motor praxeology offered a theoretical framework that enabled us to draw up a catalogue of cooperative motor behaviours. The value of this catalogue lies in its ability to reliably identify, monitor and assess the interactive abilities of children who take part in inclusive programmes based on motor cooperation.

One limitation of the present study is that it is based on a single-case design. Consequently, future research on cooperative motor behaviour in the context of inclusion programmes based around physical education should include a larger number of cases so as to confirm or refute the trends observed in this study.

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