

# Jacks and other dexterity games in children and their parents

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## ABSTRACT

Traditional games have changed with the development of technology. We analyzed dexterity games played by children and their parents in general, and jacks in particular. A survey was administered to children aged 5-12 years and their families. A total of 109 surveys were completed; 91.7 % of parents referred that they had played jacks and that 4.6 % of their children also played it ( $p < 0.00001$ ). Girls played Chinese jump rope and ring-a ring-a roses less often than their mothers, but football more often. Boys played ring-a ring-a roses less often than their fathers. Besides, 28.4 % of parents did not play any dexterity game with their children. To conclude, jacks, Chinese jump rope, and ring-a ring-a roses are now less common; and girls play football more often than their mothers. Parents do not usually play dexterity games with their children.

**Key words:** jacks, recreational games, generational shifts.

<http://dx.doi.org/10.5546/aap.2019.eng.405>

To cite: Eymann A, Cavadas A, Lejarraga H. Jacks and other dexterity games in children and their parents. *Arch Argent Pediatr* 2019;117(6):405-410.

tension and express feelings like anger, anxiety or frustration, and allows children to regulate their emotions and communicate through different behaviors, thoughts, and needs. Games are a chance for children to learn, discover different society roles, develop abilities, and understand and take in what they learn. Therefore, playing games also becomes a "gratifying, fun, and educational activity for children."<sup>3</sup>

Vygotsky defined games like a "changing activity that, above all, encourages a child's mental development." By playing with other children, a child broadens their ability to understand the reality of their social environment because they are continuously extending their *zone of proximal development*.<sup>4</sup> Freud and other authors have explained how playing games contributes to process traumatic events and, in addition, it serves as a therapeutic resource for the clinical recovery of hospitalized children.<sup>5-8</sup> Finally, some institutions that are focused on childhood claim that "playing games is the most important activity in a child's life."<sup>9</sup>

Traditional games played in the past century have changed as urban planning and technology have advanced. Such changes have resulted in new game-related activities, forms of entertainment, and bonding.<sup>10,11</sup>

One of these traditional games is jacks. This is a group game that helps to develop skills such as visual and motor coordination, calculus, respect for the rules, and social interaction guidelines. Five pieces are required to play jacks (uniform stones, balls, bone pieces, peach pits, beans, corn kernels, etc.). Jacks rules are described in *Annex 1*. In the Americas, children of the Inca Empire

"An unhealthy child  
is that who does not play."

*Friedrich Schiller*

## INTRODUCTION

Playing games is a constituent element of human beings, it allows them to develop their symbolic universe and motor skills, express their emotions, channel their fears, and explore fantasies.<sup>1</sup> It is much more common during childhood and contributes to children's development. Games have been present in all cultures since the Paleolithic era and have even helped to develop complex cultural manifestations, such as laws, morality, and rules of coexistence.<sup>2</sup>

Piaget considered that playing games was a valuable and relevant activity because it helps to release

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*Funding:*  
None.

*Conflict of interest:*  
None.

Received: 2-3-2019  
Accepted: 4-14-2019

played jacks; its name in Spanish (*payana*) comes from the Quechua *pállay* ("to gather, collect from the ground"), also known as *kapichua*. Toba and Wichi children played it with pits or seeds, which helped them to develop manual skills and also learn to count. In Argentina, it is known as *payana*, *payanca*, *chinapa*, *tinenti*, *dinenti*, *denenti* or *tenenti*. It is also played in different countries worldwide and is called *melakef* (Morocco), *hameshavamin* (Israel), *handy-dandy* (England), *osselets* (France), *chinas* or *cantillos* (Spain), *matatena* (Mexico), *tiquichuela* (Paraguay), *pepitas* (Bolivia), *pasote* (Puerto Rico), etc.

Although it has been played for thousands of years, the idea that nowadays children play jacks less often than their parents led us to study the transgenerational validity of this and other traditional games. No studies have been found that compared the dexterity games played by children nowadays in relation to the ones played by their parents or how they interact with one another.

Undoubtedly, pediatricians will play a better health care role if there is greater knowledge about the games played by children in Argentina and how parents and children bond.

In this article, we propose to assess the prevalence of dexterity games in general, and jacks in particular, in a group of healthy children and their parents.

## POPULATION AND METHODS

This was a cross-sectional study in a sample of families with children aged 5 to 12 years who attended their scheduled appointment to the pediatrician's office at a community teaching hospital in the spring of 2018. Families were invited to participate by convenience sampling and the oral consent of the accompanying family member and the child's assent was obtained. The only inclusion criterion was that the child was healthy. Children with genetic disorders, developmental disorders and/or chronic medical conditions that required follow-up by a pediatric specialist were excluded.

A questionnaire was designed by two pediatricians: one part to be completed by the family member and another one with the answers of the child, to be done independently from their parents'. The first questionnaire considered the following outcome measures: age and level of education attained by the family member, age and sex of the child, whether they had played jacks in their childhood, how old they were when they

played jacks, if they had taught their children how to play jacks, favorite dexterity games when they were their child's age (tag, football, other team sports, ring-a ring-a roses, cops and robbers, jump rope, hide-and-see or Chinese jump rope), screen hours per day (TV + computer + mobile phone + PlayStation or other electronic device), frequency of dexterity games shared with their child. The questionnaire for children included questions about whether they played jacks, their favorite dexterity games, and the games shared with their parents (*Annex 2*).

The study was approved by the institutional Committee for Research Protocol Assessment (no. 3930).

Categorical data were described as absolute values and frequencies, while continuous variables, as mean and standard deviation. The statistical analysis was done with the  $\chi^2$  test and the  $\chi^2$  test for trend. A value of  $p < 0.05$  was considered significant, and the Stata 14 software was used.

## RESULTS

A total of 109 families were invited to participate and none refused. One hundred and nine surveys were completed by 87 mothers, 22 fathers, and the 109 children. All families had health insurance (social insurance program or managed care organization), and most had completed tertiary or university education. *Table 1* describes the characteristics of parents and children.

Overall, 91.7 % of parents said that they had played jacks at some time but only 4.6 % of their children played it ( $p < 0.00001$ ). On average, parents had played jacks for the last time at the age of  $16 \pm 11.3$  years, and 22 % of them mentioned they had taught their children how to play.

*Table 2* describes the transgenerational trends between the dexterity games played by their children and by them at their children's age. Girls preferred to play tag, hide-and-see, cops and robbers, and jump rope, whereas boys were more into hide-and-see, football, tag, and cops and robbers. Most mothers had played tag, hide-and-see, and Chinese jump rope, whereas most fathers had played football, hide-and-see, and tag. It was observed that girls played Chinese jump rope less often than their mothers and football more often; boys played ring-a ring-a roses less than their fathers. Tag, hide-and-see, cops and robbers, and jump rope maintained their relevance between parents and children.

Besides, 28.4 % of parents did not usually play dexterity games with their children. Such percentage was higher among mothers than fathers, 32.2 % versus 13.7 % ( $p = 0.003$ ) (Table 3).

The games children preferred playing with their parents were grouped in the following categories: 52 % preferred dexterity games with ball control (football, tennis, basketball, etc.); 39 %, dexterity without ball control (tag, hide-and-see, biking, etc.); 57 %, board games (puzzles, chess, cards, etc.); 10 %, electronic

games (mostly PlayStation); 16 %, contact games (fighting, *cuarto oscuro* [hide-and-see in the dark], tickling); and 6%, symbolic games (dolls).

**DISCUSSION**

In this study, we described the preferences in relation to dexterity games played by schoolchildren, the trends related to games that remained or changed from one generation to the next, and the proportion of fathers versus mothers who played dexterity games with their children.

The results show a marked transgenerational reduction in jacks. Children play jacks much less often than their parents. A total of 91.7 % of parents played jacks, while only 4.6 % of their children play it now; a similar situation, but to a lesser extent, was observed in relation to Chinese jump rope and ring-a ring-a roses. It is striking that, after only one generation, children have stopped playing jacks almost altogether, although it had been played for at least 2000 years.

It is interesting that games like tag, hide-and-see, jump rope, and cops and robbers have prevailed across the generations. Other games, like jacks, are clearly declining among the new generations. There is no knowledge on why these

TABLE 1. Characteristics of parents and children

* Family member	Mothers	87 (79.8)
	Fathers	22 (20.2)
** Age (years old)		42.6 ± 6
* Level of education attained	Primary education	4 (3.7)
	Secondary education	20 (18.3)
	Tertiary / university education	85 (78)
* Sex	Girl	48 (43.5)
	Boy	61 (56.5)
** Age (years old)		9.17 ± 2.1
** Screen use (h/day)		3.3 ± 1.5

\* Absolute number and percentage.  
 \*\* Mean and standard deviation.

TABLE 2. Dexterity games played by children and that their parents played in their childhood, by sex

	Mothers n = 87 %	Girls n = 48 %	* p value	Fathers n = 22 %	Boys n = 61 %	* p value
Tag	87	87.2	0.98	81.2	80.3	0.85
Football	8	38.3	< 0.001	86.4	82	0.44
Other team sports	34.5	57.4	0.001	31.8	47.5	0.02
Ring-a ring-a roses	25.3	12.8	0.03	9.8	1	0.005
Cops and robbers	56.3	59.6	0.6	63.6	63.9	0.97
Jump rope	77	59.6	0.12	18.2	13.1	0.32
Hide-and-see	82.8	78.7	0.47	81.8	88.5	0.16
Chinese jump rope	83.9	34	< 0.001	13.1	9	0.37

\*  $\chi^2$  test.

TABLE 3. Frequency of dexterity games played by parents and their children (n = 109)

	Mothers %	Fathers %	p value
Almost every day	10.3	13.6	
At least once a week	36.8	50	
At least once a month	16.1	18.2	
Less than once a month	4.6	4.5	
Do not usually play	32.2	13.7	
$\chi^2$ test for trend			0.003

millennial games have been abandoned by the current generation.

In our study, children's favorite games shared with their parents were mostly motor games (dexterity games with and without ball control, contact games), followed by board, electronic, and symbolic games. A study conducted in the Autonomous City of Buenos Aires compared the games played by children aged 7-12 years and those played by their parents and also found that children and their parents played mostly motor games (47.5 % versus 58.2 %, respectively), although an intergenerational difference was observed in relation to electronic games (30.2 % versus 0.57 %, respectively) and symbolic games (7.6 % versus 25.6 %, respectively) in terms of preference.<sup>12</sup>

The greater involvement of girls in football may be explained by the new gender perspectives in our culture, which tend to reduce the preexistent clear sexual difference in children's games and in other areas of daily life (clothes, traditions, employability, etc.).<sup>13,14</sup> The emergence of female football in Argentina is a sign of such trend.

Art has usually represented aspects of society in every era, from cave paintings to current graffiti in urban areas. *Figure 1* shows the painting *Children's Games*, by Pieter Brueghel the

Elder, from 1560. It depicts different children's games, like hide-and-seek, hoop, leapfrog or tree climbing, and in the right lower corner, there are two children playing with stones on the ground, which may represent jacks.

It is undeniable that children's games have changed over time, and this is a manifestation of cultural changes. So much that the game phenomenon describes how humankind and childhood have evolved.<sup>10</sup> As per Maestro, the transmission of traditional games takes place in two ways: vertically (transgenerational), in the family, and horizontally, in the neighborhood and school, through socialization.<sup>15</sup> The games that are still prevalent are those that allow to develop education or to maintain motor or social skills, which confirms the idea that games play the role of the main and most effective *teachers*. Through games and toys, children learn the values of their ancestors, and maintain and convey them to the new generations in multiple ways and spaces.<sup>11</sup>

It is worth noting in this article that online games are increasingly captivating children. As per our study, children use screens for an average of 3.3 hours a day, compared to a study done in the province of Córdoba, which reported that screen use was limited to 76 minutes a day for TV and 31 minutes for other screens.<sup>16</sup> The impact of these games on children's development is still

FIGURE 1. *Children's Games*, by Pieter Brueghel (1530-1569)



controversial. However, the Sociedad Argentina de Pediatría recommends to restrict TV use to 1-2 hours per day.<sup>17</sup>

In urban populations, the time to play games is restricted due to the lower availability of safe recreational places, the wide range of after-school activities, and the fact that cities are built focused on their development and working citizens rather than on children. Cities should not be designed leaving out the needs and desires of children. This concept has been described repeatedly by Francisco Tonucci in his writings and drawings, as shown in *Figure 2*.<sup>18</sup>

Public space (streets, parks, squares) has been decreasing due to the city's urban agglomerations and the changes in its building infrastructure. Such reduction in recreational spaces has also been described in the study by Stefani, which reported that the use of the streets and the sidewalk as a space for playing games by children decreased from 25.5 % to 6 % compared to their parents.<sup>12</sup> Likewise, another study analyzed the space preferred by children to play games and 100 % stated that they preferred doing activities outdoors and in open or semi-open large areas.<sup>19</sup>

In addition, article 31 of the Convention on the Rights of the Child describes the right of the child "to rest and leisure, to engage in play and recreational activities appropriate to the age of

the child and to participate freely in cultural life and the arts," as well as "to participate fully and with equal opportunities in cultural, artistic, recreational and leisure activity."<sup>20</sup>

Our study shows that many parents admit that they do not usually play dexterity games with their children, particularly mothers. These results, which are based on the questions answered by the parents, should be supplemented with the subjective experience of children in relation to their parents' habits. Based on a study conducted in 3573 children younger than 6 years, it could be said that game-sharing between parents and children is an extremely variable activity, which may range from 10 % to 70 % among families over a child's life experience.<sup>21</sup>

Possibly, current employment modalities with extended working periods may interfere with the time available for playing games. This way, the ability to see the world from children's perspective is gradually disappearing, and this may modify the communication and relationship with them.<sup>22</sup>

In addition, it is observed that gender stereotypes are still prevalent given that mothers play less dexterity games than fathers. Other studies have described that gender behavior is shaped in children based on age and sex, initially starting with their families.<sup>23</sup>

Some of the limitations of this study are that the sample was small and included urban families with health insurance and a high level of education, so results cannot be extrapolated to other social groups or regions of Argentina.

Finally, more information is required so that pediatricians are able to better understand the meaning of these changes in children's games and their impact on development.

## CONCLUSION

Tag, cops and robbers, hide-and-seek, and jump rope have maintained their prevalence over two generations; however, the frequency of other games, like jacks, Chinese jump rope, and ring-a-ring-a-roses, has reduced significantly. Girls play football more often than their mothers, and both mothers and fathers tend to play few dexterity games with their children. ■

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FIGURE 2. *The city of children*, by Francesco Tonucci



Poster text: Sorry for the inconvenience. We are playing for you.

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## ANNEX 1.

### Rules to play jacks

There are many local variations; one of the most common forms is played as follows:

1. Players sit down on the floor in a circle and take turns to play.
  2. The first player scatters the stones on the floor, takes one and tosses it in the air while picking up one stone from the floor with the same hand. The player must grab the stone they threw in the air before it touches the floor. The game continues until each of the remaining stones are picked. The first round is called the *onesies*.
  3. Next, the player scatters all the stones back on the floor and picks up two stones from the floor instead of one (*twosies*).
  4. The next round, the player has to pick up three stones at the same time and then the remaining one, or vice versa (*threesies*).
  5. Finally, the player must hold four stones in their hand, toss the fifth stone in the air, then place the four stones on the floor and grab the first one back. Next, they have to throw it in the air, pick up the four stones from the floor and catch the one that was thrown before it touches the floor (*foursies*).
  6. Each time a player makes a mistake, they get penalized and it is the turn of the next player, who starts where they left off in the previous round. A mistake would be moving the stones that are still on the floor while trying to pick up one, letting the stone thrown in the air touch the floor or not picking up the required number of stones.
  7. Once the player successfully completes the four rounds, they can score points in the scoring round. To this end, sometimes different operations are made one after the other. One option is to place four stones forming the corners of a square and pick up one by one as in the first round, but instead of leaving out the stone that was picked up, it should be tossed in the air together with the previous one(s). Once the operation ends, the player gets 10 points for each stone that they can keep in their hand. Another variation is to grab the five stones, throw them in the air, then flip the hand and try to grab as many as possible on the back of the hand. Then the player throws the stones that they have left on the back of their hand back in the air and tries to grab them with the palm. Each stone scores 10 points. There are no penalties during the scoring round.
  8. Once the scoring ends, the onesies round starts again.
- Usually, jacks can be played based on two modalities: the good and the bad.
    - During the good set, it is allowed to move any of the stones still on the floor while trying to pick up the others.
    - During the **bad set**, if the player moves any of the stones, they are penalized and lose their turn. In both cases, any player who drops the stone that was thrown in the air or any of the ones that were picked up will be penalized.
  - In general, stones should not be rounded so that they do not roll on the floor or fall too far apart.
  - Sometimes, small marble cubes of approximately 1 cm may be used.

## ANNEX 2.

### Questionnaire about games played by children

Dear family: the purpose of this survey is to know about the game modalities played by your child. Information will be confidential and used for academic purposes only. Thank you for your help.

#### TO BE COMPLETED BY THE PERSON ACCOMPANYING THE PATIENT

• **Person completing the survey:**

Mother.                       Father.   
Grandmother.                       Other.

• **Age of the person completing the survey:** ..... years.

• **Please indicate the highest level of education attained:**

No education.                       Tertiary education.   
Primary education.                       University education.   
Secondary education.

• **Patient's age:** .....years.

• **Patient's sex:**

Male.                       Female.

#### CHECK ONLY THE OPTION THAT YOU MOST AGREE WITH.

1) **Have you ever played jacks?**

Yes.                       No.

If Yes, how old were you when you played jacks for the last time?  
..... years old.

2) **Have you taught your child how to play jacks?**

Yes.                       No.

3) **Does your child play jacks now?**

Yes.                       No.

4) **Please indicate your favorite dexterity games when you were your child's age.**

Tag.                       Ring-a ring-a roses.                       Hide-and-peek.   
Football.                       Cops and robbers.                       Chinese jump rope.   
Other team sports.                       Jump rope.                       Other.   
None.

5) **Please indicate the dexterity games played by your child.**

Tag.                       Ring-a ring-a roses.                       Hide-and-peek.   
Football.                       Cops and robbers.                       Chinese jump rope.   
Other team sports.                       Jump rope.                       Other.   
None.

6) Please indicate the hours your child spends approximately every day using a screen (TV + computer + PlayStation or other device).

..... hours per day.

7) Do you play any dexterity game with your child?

- Almost every day.  At least once a week.   
At least once a month.  Less than once a month.   
I do not usually play games.

**TO BE COMPLETED BY THE PATIENT OLDER THAN 5 YEARS**

8) Do you know how to play jacks?

Yes.  No.

9) Which games do you like to play?

- |                    |                       |                      |                       |                    |                       |
|--------------------|-----------------------|----------------------|-----------------------|--------------------|-----------------------|
| Tag.               | <input type="radio"/> | Ring-a ring-a roses. | <input type="radio"/> | Hide-and-peek.     | <input type="radio"/> |
| Football.          | <input type="radio"/> | Cops and robbers.    | <input type="radio"/> | Chinese jump rope. | <input type="radio"/> |
| Other team sports. | <input type="radio"/> | Jump rope.           | <input type="radio"/> | Other.             | <input type="radio"/> |
| None.              | <input type="radio"/> |                      |                       |                    |                       |

10) Which games do you like to play with your mom or dad?

.....