

INTERNATIONAL MEDICAL REVIEW ON DOWN'S SYNDROME

www.elsevier.es/sd



CLINICS AND PRACTICE

Skills and social interaction of children with Down's syndrome in regular education

R. Valdívia Lucisano^a, L.I. Pfeifer^{b,*}, M.P. Panuncio-Pinto^b, J.L. Ferreira Santos^c
and P.P. Gomes Anhão^d

^aMedical School, University of São Paulo, Ribeirão Preto, São Paulo, Brasil

^{b,*}Department of Neuroscience and Behavioral Sciences, Medical School, University of São Paulo, Ribeirão Preto, São Paulo, Brasil

^cDepartment of Social Medicine, Medical School, University of São Paulo, Ribeirão Preto, São Paulo, Brasil

^dDepartment of Social Medicine, Graduate Program in Health, Medical School, University of São Paulo, Ribeirão Preto, São Paulo, Brasil

KEYWORDS

Down's syndrome;
Social Interaction;
Child;
Social skills

Abstract

This study identifies the process of social interaction of children with Down's syndrome (DS) in the regular educational system of a city in the interior of São Paulo, Brazil. Six children aged from three to six years old participated in the study. Each child was videotaped in four situations of social interaction in two distinct environments (indoors and outdoors), which enabled the analysis of interpersonal and self-expression skills through the observation of 15 types of behaviors. The results reveal that the behavior type "Interacts with another child", within the category "interpersonal skills", was the most frequent both indoors and outdoors with an average of 27.5 and 28.3, respectively. With regard to "selfexpression skills", only the behavior "Smiles" had a considerable number of occurrences indoors with an average of 8.16, while the behaviors "Smiles" and "Imitates other children" presented significant occurrence outdoors with averages of 5.16 and 3, respectively. The conclusion is that including children with DS in the regular educational system promotes new forms of learning and interaction for them through daily contact with children with typical development, enabling them to acquire social interaction skills.

Received on April 17, 2012; accepted on June 26, 2013

* Author for correspondence.

E-mail: luziara@fmrp.usp.br (L.I. Pfeifer).

PALABRAS CLAVE
 Síndrome de Down;
 Interacción social;
 Niños;
 Habilidades sociales

Habilidades e interacciones sociales de los niños con síndrome de Down en la educación ordinaria

Resumen

En este estudio se identifica el proceso de interacción social de los niños con síndrome de Down (SD) en el sistema educativo ordinario de una ciudad en el interior de São Paulo (Brasil). En el estudio participaron 6 niños de 3 a 6 años de edad. Se filmaron vídeos de cada niño en cuatro situaciones de interacción social en dos ambientes diferentes (interior y exterior), lo que permitió analizar las habilidades interpersonales y de autoexpresión a través de la observación de 15 tipos de conductas. Los resultados revelan que el tipo de conducta *"interactúa con otros niños"*, dentro de la categoría de "habilidades interpersonales", fue la más frecuente tanto en ambiente interior como en exterior, con una media de 27,5 y 28,3, respectivamente. Teniendo en cuenta las habilidades de autoexpresión, sólo la conducta *"sonríe"* se dio una cantidad de veces destacable en interiores, con una media de 8,16, mientras que las conductas *"sonríe"* e *"imita a otros niños"* tuvieron una presencia significativa en exteriores, con unas medias de 5,16 y 3, respectivamente. En conclusión, incluir niños con SD en el sistema educativo ordinario promueve en ellos nuevas formas de aprendizaje e interacción mediante el contacto diario con niños con desarrollo normal, lo que les permite adquirir habilidades de interacción social.

Introduction

Down's syndrome (DS), or trisomy 21, is a very frequent chromosomal abnormality that occurs due to an extra genetic load from the time of development within the uterus, marking the child for her/his entire life¹. Confirming trisomy 21 has no prognostic value, since there is a consensus among the scientific community that there are no degrees of DS; developmental differences are due to individual characteristics (genetic inheritance), stimulation, education, environment, and presence or absence of clinical disorders, among others². The mental development and intellectual skills of children with DS encompass a large range between mental retardation and intelligence close to standards considered normal³.

With regard to developmental milestones, children with DS experience some delay in comparison to children with typical development, while there is a great variability concerning the speed with which skills are acquired among children with DS. Various factors may cause this delay but the main factor is a lack of early and frequent stimulation in the environment where the child lives⁴. Therefore, living in a demanding environment that promotes a diversity of stimuli and different possibilities for discovery enables individuals' cerebral reorganization and plasticity². Therefore, the school environment becomes an important space for promoting learning and the development of social skills.

The school, as well as the family, is one of the primary microsystems promoting the development of individuals. It is the second most important social institution for children, especially for those with impairments, because the school is a privileged space for encouraging cognitive functions and social skills⁵.

Social skills are socially acceptable learned behaviors that permit the individual to effectively interact with another and avoid or escape from non-acceptable behavior that results in negative social interactions⁶. An appropriate repertory of social skills or different classes of social behaviors is required for children to satisfactorily interact social-

ly with peers and teachers and deal appropriately with the demands of interpersonal situations⁷. A deficit in the comprehension or performance of the demands of a situation and culture interferes in the quality of social relations⁸. The importance of acquiring social skills is acknowledged by all theories of development, being essential in social adjustment processes both for children with typical development and for those with some disorder/impairment⁹.

Social interactions are seen as educative interactions to the extent they present conditions for individuals to acquire concepts, skills and cognitive strategies that affect social development and learning⁷. Social skills in children and adolescents facilitate the initiation and maintenance of positive social relations, contribute to their acceptance by peers and result in a satisfactory school adjustment⁶.

In a school environment, children with DS aged between three and six years old do not present significant differences in the process of social interactions when compared to children with typical development. There is however a deficit in the assertive social skills of children with DS; they tend to have less initiative, showing more passive social behavior¹⁰.

This study identifies the social skills of children with DS through the process of interaction with children with typical development and verifies whether behaviors differ given the school environment (indoors and outdoors).

Methods

This is a quantitative non-experimental, cross-sectional study with an analytical descriptive approach and, given its characteristics, can be classified as a multiple case study. All ethical criteria for research involving human subjects were complied with.

Six children with DS aged between three and six years old enrolled in early childhood education programs in municipal schools of the regular education network of Ribeirão Preto,

SP, Brazil participated in the study. There is a small number of participants because the focus is on the quality of these children's social interactions and also because this is an observational descriptive study.

The children were observed during extracurricular activities (outdoor and large areas) and during academic activities (indoors and restricted areas). There were no directed pedagogical actions during extracurricular activities, which took place in the schools' sports court, sand box, soccer field and playroom. Outdoor areas were similar in all the schools and had large metal play equipment (slide, merry-go-round, tunnel, seesaw, play house), sand toys (bucket, sieve, shovel) and others, such as balls, dolls, saucepans, cars, and construction toys. In these places, children were free to develop their creativity and interact socially during play.

Academic activities took place in more restricted and closed areas composed of tables and chairs with didactic material and toys. Children in these environments generally remained seated in chairs and were gathered at collective tables to develop structured pedagogical activities proposed by the educator. The use of material such as A4 sheets, activity handouts, crayons, colored pencils, ink and brushes, scrap material, Play-Doh, and glue, among others, were frequently observed.

The children's behavior was recorded with a digital camcorder focused on the participant; interactions between participants and the researcher(s) were avoided during filming. Filming was initiated when the directed activity began according to data collection protocol used by Anhão¹¹. Each child was filmed in two sessions of 15 minutes each on two different days: one session outdoor and one session indoor.

Data collected during filming were analyzed quantitatively. The two sessions were counted together in order to obtain an average of behavior presented by the participants in each of two environments.

A form created by Anhão¹¹ containing a checkbox for each minute of footage (a total of 15 minutes) for each of the behaviors within the categories of interpersonal skills and self-expression skills was used to record data. Each behavior was checked either as present or absent in each minute of each 15 minutes session of filming. Hence, an (X) was placed in the behavior's checkbox whenever any of the behaviors described below were observed and the minute when it was manifested was also recorded, according to the following categories:

1. Interpersonal skills: "Interacts with another child"; "Interacts with an adult (educator)"; "Interacts with objects (toys, didactic material)"; "Competes with another person for the educator's attention"; "Fights or hits"; "Presents self-defense"; "Establishes initial contact with other children"; "Plays together but with different objects"; and "Plays together with the same type of object".

2. Self-expression skills: "Cries"; "Smiles"; "Stays alone"; "Sings"; "Imitates other children"; and "Imitates the educator".

The signed-rank test adjusted for ties was applied to compare the medians of each skill manifested indoors with skills manifested outdoors¹².

Results

With regard to interpersonal skills, the results show that the behavior "Interacts with another child" is the most frequent behavior both indoors and outdoors, with an average of 27.5 and 28.3, respectively.

The behaviors "Interacts with objects" and "Plays together with the same object" followed with high frequencies, though their averages are inverted in the two environments. The behavior "Interacts with objects" presents an average of 26 indoors while the behavior "Plays together with the same object" presents an average of 22.5 in the frequency of behaviors presented by the studied children indoors. Outdoors, the behavior "Plays together with the same object" presents an average of 21 while the behavior "Interacts with objects" presents an average of 15.5 in the same environment.

Another very frequent behavior in both environments is "Interacts with the educator", which presents an average of 17.83 indoors and 7.5 outdoors. The behavior "Establishes initial contact with another person" presented an average frequency of 10.5 indoors and 6.6 outdoors.

The behaviors "Competes with another person for the educator's attention", "Fights or hits" and "Presents self-defense" were not very frequent in either environment and presented an average below 1 in both cases.

The results concerning the interpersonal skills presented by children indoors and outdoors are presented with greater detail in Figure 1:

Among the behaviors within the category self-expression skills, only the behavior "Smiles" presented a significant frequency with an average of 8.16 in the frequency of behaviors manifested indoors. The behaviors "Smiles", "Imitates other children" and "Stays alone" were not very fre-

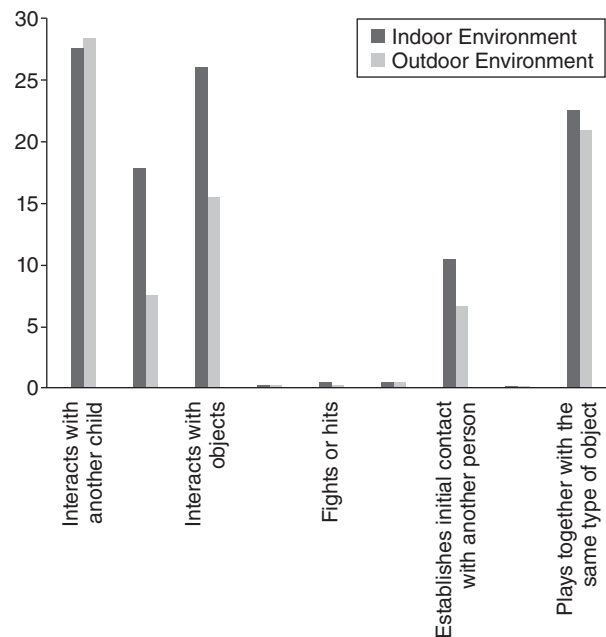


Figure 1 Frequency of behaviors concerning interpersonal skills in each environment.

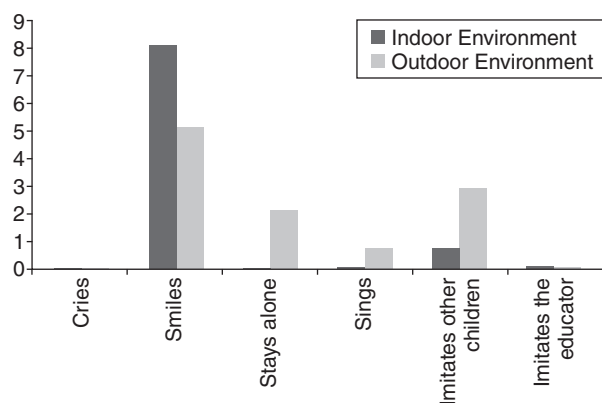


Figure 2 Frequency of behaviors concerning self-expression skills in each environment.

quent outdoors and presented averages 5.16, 3 and 2.16, respectively.

The remaining behaviors presented average frequencies below 1 as shown in Figure 2.

No significant differences were observed between environments when the behavior categories were compared, except for the behavior “*Interacts with the educator*”, which more frequently occurs indoors. The results are presented in Table 1.

Discussion

Children acquire and improve cognitive, emotional, and social skills that will accompany them during their entire lives in the school’s different environments¹³. Therefore, including students with special needs within the regular educa-

tional system is a complex process and requires the involvement and participation of all members within school organizations. This inclusion should be planned in such a way that students with similar ages participate together in all school activities and are gathered in the same class, even if they have different learning objectives with different degrees of complexity. The development of knowledge concerning interactions among students with DS, their classmates and teachers in the regular educational system is both a scientific and a social need, since it supports characterizing and improving school inclusion processes¹⁴.

Interpersonal skills

The most frequent behaviors within this category of skills included “*Interacts with another child*”, “*Interacts with objects*” and “*Plays together with the same type of object*”. Children with DS very frequently presented the first two behaviors in both environments. Verbal and non-verbal communication, that is, with another individual and interaction with objects, is a basic element of social development, and the ability to manifest them in a coherent and complementary way is essential for a socially competent performance⁷.

When a child begins to enter other microsystems in addition to the family, the quantity and diversity of interlocutors increases, as well as the opportunities to apply and improve his/her social repertory, which influences in a decisive way his/her acquisition and performance of social skills. Considering the relationship with classmates when the child enters school, a greater variability of models and demands is presented for her/him to acquire new social skills⁷.

It is interesting to study the presence of students with deficiencies in a regular educational environment once children adopt the standards of the group for themselves,

Table 1 Comparing each skill manifested outdoors and indoors (signed-rank test)

Skills	Behaviors	Z value	P value
Interpersonal	Interacts with another child	0,43	0,670
	Interacts with an adult	1,78	0,075
	Interacts with objects	1,98	0,046 [§]
	Competes with another person for the educator’s attention	0,00	1,000
	Fights or hits	1,41	0,159
	Presents self-defense	0,00	1,000
	Establishes initial contact with other children	0,87	0,462
	Plays together but with different objects	*	*
	Plays together with the same type of object	0,53	0,597
Self-expression	Cries	*	*
	Smiles	1,57	0,116
	Stays alone	1,71	0,087
	Sings	1,00	0,317
	Imitates other children	1,59	0,113
	Imitates the educator	1,00	0,317

[§]Significant.

*Not possible to calculate.

as well as the social interactions that occur naturally between students with deficiencies and the remaining students, focusing on another's role as mediator of one's interaction within society¹⁵. It is possible to infer that the studied children learn with their peers when included in extra-curricular activities within the school environment, developing and performing social skills during such interaction.

The behaviors "*Plays together with the same type of object*" and "*Plays together but with different objects*" are inter-related and refer to playtime and how these objects are used in this context. When the child plays together but with different objects, s/he presents parallel play and is developing basic socialization skills. When the child plays together with the same object, however, s/he presents cooperative play and is exercising and broadening socialization skills¹⁶. This study shows that only the behavior "*Plays with the same object*" was frequently observed both indoors and outdoors. This situation suggests that children tend to play with the same object or develop play in order to achieve the same objectives, which requires the use of the same object, when they are in the same environment¹⁰. Such a situation indicates more complex play that encourages social interaction skills.

The behaviors "*Competes with another person for the educator's attention*", "*Fights or hits*" and "*Presents self-defense*" show how the participants react to situations of conflict. The fact these occurred with low frequency suggests that children with DS were well-adapted to the school environment and interacted well with their classmates.

Studies show that inclusion benefits children with deficiencies in many aspects, such as in relation to speaking skills, social behavior and academic performance^{17,18}. Such a fact may be related to the diversity of stimuli provided within the school environment since a demanding environment that promotes different possibilities of discoveries enables the individuals' cerebral reorganization and plasticity².

The behavior "*Interacts with the educator*" presented very different frequencies depending on the environment: it was very frequent indoors but infrequent outdoors. This finding suggests that children interact more with their peers when outdoors in unstructured play, while educators are more attentive to the children's actions, helping them with tasks and encouraging them to play when in the classroom (indoors). Accordingly, children also seek out educators to show them their work. It is important to note that through inclusion in school, children start to spend time with their peers and enlarge their universe of social interaction and present behaviors similar to those observed in children with typical development.

The same is observed in relation to the behavior "*Establishes initial contact with another person*". This behavior occurred with a relatively low frequency outdoors in comparison to the indoor context. It is possible that children with DS have a greater difficulty initiating social contact as a result of a lack of experience in environments outside the family's micro system. In more familiar environments of daily living such as the classroom, such skill may develop more easily. These results suggest that children with DS present a deficit in assertive social skills, which are those that

depend on initiative, and develop better passive social skills, or those skills in which the environment plays a determinant role¹⁰. Hence, the school environment facilitates social interactions and consequently the development of skills for children to perform well in society.

Self-expression skills

Among the self-expression skills, the behavior "*Smiles*" presented the greatest occurrence in both studied environments, which suggests that children with DS feel well when interacting with their peers in school activities.

Other behaviors, which like "*Smiles*" express emotion, such as "*Cries*" and "*Sings*" very rarely appear. It does not mean that these behaviors do not occur frequently. We suppose that such behaviors were just not very frequent during filming.

The behavior "*Stays alone*" was not very frequent either, which likely indicates that children with DS have the potential to interact with their peers when they have the opportunity.

For children, attending school means entering a new world in which they have to progressively acquire increasingly complex knowledge, which will be demanded by society and the bases of which are essential to the education of any individual¹⁹. One of the greatest objectives in early childhood education is to enable children to become more autonomous in the classroom, that is, to internalize rules of social life so they can conduct themselves without disturbing the group; social conformity is *sine qua non* for an individual to be integrated into a group¹⁹.

In relation to the behaviors "*Imitates other children*" and "*Imitates the educator*", the first presented a much more significant frequency both indoors and outdoors. This does not mean that the educator does not play an essential role in the process of social interaction and inclusion, but children this age demand more interaction with other children who also have the same interests. The educator was present all the time, enabling children to develop their social skills¹¹.

These results suggest that children with DS have a greater tendency to imitate other children's behaviors rather than to seek a "model" among educators (adults). Hence the importance of the school environment in the inclusion process; the school enables children with DS to have greater contact with children the same age with typical development, which does not occur in the protected environment of special education or even in therapeutic settings¹¹.

This study's results make clear that the inclusion of children with DS in the regular education network promotes new forms of learning and interaction through daily life with children who have had typical development, leading to the acquisition of skills necessary for them to perform well in society.

Funding

The São Paulo Research Foundation (FAPESP) supported this study through an undergraduate research scholarship provided to the primary author.

References

1. Moeller I. Diferentes e Especiais. *Rev Viver Mente e Cérebro*. 2006;156:26-31.
2. Silva MFMC, Kleinhans ACS. Processos cognitivos e plasticidade cerebral na Síndrome de Down. *Rev Bras (ed. esp., Marília)*. 2006;12(1):123-38.
3. Canning CD, Pueschel SM. Expectativas de desenvolvimento: visão panorâmica. In: Pueschel SM, organizador. *Síndrome de Down: guia para pais e educadores*. 9.ª ed. Campinas: Papyrus; 2005.
4. Reis filho AD, Schuller JAP. A capoeira como instrumento pedagógico no aprimoramento da coordenação motora de pessoas com Síndrome de Down. *Pensar a Prática*. 2010;13(2):121.
5. Pereira-Silva NL, Dessen MA. Crianças com e sem síndrome de Down: valores e crenças de pais e professores. *Rev Bras Educ Espec*. 2007;13(3):429-46. [Accessed January 31 2010.] Available at: http://www.portaleducacao.com.br/arquivos/arquivos_sala/media/objeto_de_aprendizagem_crianças_si_ndrome_down_valores_crenças_pais_professores.pdf
6. Gresham FM. Análise do comportamento aplicada às habilidades sociais. In: Del Prette ZA, Del Prette A, org. *Psicologia das Habilidades Sociais: Diversidade Teórica e suas implicações*. Petrópolis, RJ: Vozes; 2009. p. 17-56.
7. Del Prette ZA, Del Prette A. *Psicologia das habilidades sociais na infância: Teoria e Prática*. 4.ª ed. Petrópolis, RJ: Vozes; 2009.
8. Molina RCM, Del Prette ZAP. Funcionalidade da relação entre habilidades sociais e dificuldades de aprendizagem. *Psico-USF*. 2006; 11(1): 53-63. Available at: <http://scielo.bvsps.org.br/pdf/psicousf/v11n1/v11n1a07.pdf>
9. Angélico AP. Estudo descritivo do repertório de habilidades sociais de indivíduos com Síndrome de Down. *Dissertação de Mestrado, Universidade Federal de São Carlos*. São Carlos, SP. 2004.
10. Anhão PPG, Pfeifer LI, Santos JLF. Interação Social Crianças com Síndrome de Down na Educação Infantil. *Rev Bras Educ Espec*. 2010;16:31-46.
11. Anhão PPG. O processo de interação social na inclusão escolar de crianças com Síndrome de Down em educação infantil. *Dissertação de Mestrado, Programa de Pós-Graduação em Saúde na Comunidade, Faculdade de Medicina de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto*, 2009.
12. Snedecor GW, Cochran WG. *Statistical methods*. 8.ª ed. Ames, IA: Iowa State University Press, 1989.
13. Gubern TV. La etapa escolar y el alumno con síndrome de Down. *Rev Med Int Sindr Down*. 2010;14(2):31-3.
14. Teixeira FC, Kubo OM. Características das interações entre alunos com Síndrome de Down e seus colegas de turma no sistema regular de ensino. *Rev Bras (ed. esp.)*. 2008;14(1):75-92.
15. Batista MW, Enumo SRF. Inclusão escolar e deficiência mental: análise da interação social entre companheiros. *Estudos de Psicologia*. 2004;9(1):101-11.
16. Parham LD, Fazio LS. *A recreação na terapia ocupacional pediátrica*. São Paulo: Santos; 2000.
17. Buckley S, Bird G. Including children with Down Syndrome. *Down Syndrome News & Update*. 1998;1(1):5-13.
18. Buckley S, Bird G, Sacks B, Archer T. A comparison of mainstream and special education for teenagers with Down syndrome: implications for parents and teachers. *Downs Syndr Res Pract*. 2006;9(3):54-67.
19. Milss ND. A educação da criança com Síndrome de Down. In: Schwartzman JS, et al., eds. *Síndrome de Down*. São Paulo: Mackenzie Memnon; 1999. p. 232-62.