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Preschool and School Aggression: Adaptation and Validation of the Preschool Social Behavior Scale in Chile

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Abstract

Recognizing aggressive behavior at an early age is vital to identify problematic trajectories that may increase the risk of behavioral and social adaptation problems at school and during adolescence. This requires scales capable of measuring this behavior. In this study, the Scale of Preschool Social Behavior (PSBS) - Teacher Form was validated using a Confirmatory Factor Analysis (CFA) in a national context. We used a sample of 538 children and 12 educators from 4 kindergartens and 5 public schools in Santiago, Chile. The results revealed two main factors: aggression and pro-social behavior, similar to the original scale. This study contributes to the early detection of physical and relational aggression in the preschool stage through the development of reliable measurements that guide prevention programs.

Keywords: Aggression, preschool, scale, social behavior.

Agresión Preescolar y Escolar: Adaptación y Validación de la Escala de Conducta Social Preescolar en Chile

Resumen

Reconocer el comportamiento agresivo a una edad temprana es vital para identificar trayectorias problemáticas que pueden aumentar el riesgo de presentar problemas de adaptación conductual y social en la edad escolar y durante la adolescencia. Para ello, es necesario contar con escalas válidas capaces de medir este comportamiento en el contexto nacional. En este estudio, la Escala de Comportamiento Social Preescolar (PSBS) - Forma para profesores fue validada usando un Análisis Factorial Confirmatorio (CFA). Se utilizó una muestra de 538 niños, 12 educadores de 4 jardines infantiles y de 5 escuelas en Santiago, Chile. Los resultados revelaron dos factores principales: la agresión y el comportamiento pro-social, que es similar a la escala original. Los resultados de este estudio esperan contribuir a la detección temprana de la agresión física y relacional en la etapa preescolar, a través del desarrollo de medidas confiables que guíen los programas de prevención.

Palabras clave: agresión, conducta social, escala, preescolar.

Introduction

AGGRESSION IS a multidimensional phenomenon that can be classified in different ways based on how it is expressed (verbal, physical), how it is directed (open or concealed) or how it is motivated (reactive or proactive) (Berkowitz, 1993; Bushman & Huesmann, 2010; Crick, 1996; Vitaro et al., 1998). According to diverse array of studies, human beings can begin to show signs of aggression at a very early age. In fact, the likelihood of exhibiting signs of early age aggression reaches its highest point at two and a half years old and then progressively diminishes as children develop social skills and language that allows them to communicate their frustration and emotions more constructively, being these adaptive behaviors (Tremblay et al., 2008). For example, a six-year longitudinal study with a sample of 10,658 Canadian children and adolescents aged 2 to 11 years examined aggressive behavior using face-to-face interview with the Person Most Knowledgeable about the child (PMK). One of the most interesting results was that physical aggression was observed to decrease between the ages of 4 and 11 years and was more frequent in boys than in girls in early childhood (Côté et al., 2006).

Despite this natural tendency to act aggressively, other studies have shown that individuals can vary considerably in terms of the swiftness and frequency with which they show aggressive behavior and have identified key factors that influence aggressive tendencies. The first of these factors is gender and clear differences are seen between boys and girls both in terms of frequency since girls at age 4 resort to physical aggression almost twice as often as boys and then decrease their use of physical aggression before boys do. In terms of the type of aggression, as girls use more indirect aggression between the ages of 6 and 11 and boys show more physical aggression (Archer & Côté, 2005). In addition, it has also been observed that men engage in more physical aggression while women are more likely to use relational aggression through social exclusion or

by undermining a person's self-esteem (Crick, 1996; Crick & Grotpeter, 1996).

Other studies have pointed to the usefulness of distinguishing between physical (open, direct) and relational (indirect, social) aggression based on instruments that use more than one factor to measure this behavior (Björkqvist & Niemelä, 1992; Crick & Grotpeter, 1996). Another important distinction can be made between reactive and instrumental aggression. Reactive aggression refers to the use of aggression as a response to an actual or perceived offense (hitting, insult as a response to a threat). Instrumental or proactive aggression is not preceded by any offense and instead aggression is used as a tool to achieve or obtain something (resources, domination, social status, etc.). Some authors have linked reactive aggression to an impulsive rage motivated by a desire to hurt someone and as a reaction to an immediately preceding frustration or provocation (Anderson & Bushman, 2002). On the other hand, instrumental aggression has been associated with premeditated, calculated, and often emotionless behavior (González-Peña et al., 2013).

The findings of the investigations and reviews that have assessed child aggression seem to indicate that one of the reasons why studies have generally not been conducted in preschool classrooms is because of the traditional methodology used to measure aggressive behaviors in a school environment have used exploratory instruments that require reading and writing skills, as questionnaires and self-reporting (Ortega & Monks, 2005). To both understand aggression in the preschool stage and to develop effective solutions, it is essential to develop assessment tools that allow diagnostic reports of aggression in school settings to be made (Hahn et al., 2007). The early detection of patterns of aggressive behavior in children is essential to prevent and treat social and behavioral adaptation problems. Many authors have noted that, without prevention, initial risk factors tend to accumulate and increase over time, thereby causing children to begin during elementary education with a high

risk of maladaptive behavior if they leave preschool without learning strategies to control their aggression (Fergusson et al., 2005; Tremblay, 2000).

One of the difficulties of assessing aggressiveness throughout the life cycle is the lack of conceptual clarity of this construct and the absence of a common theoretical framework among researchers (Berkowitz, 1993; Kempes et al., 2005). Nevertheless, tools and strategies have been developed to evaluate aggressive behaviors in children in the school context, through reports made by teachers and educators (Mcevoy et al., 2003). However, the availability of the tools used to assess aggressive behavior in young children still seem insufficient in the Chilean context considering the importance of early detection. Currently, instruments that measure development are widely used, as the Test de Aprendizaje y Desarrollo Infantil, TADI (Chile Crece Contigo, 2018) or the Strengths and Difficulties Questionnaire (SDQ) (Brown et al., 2014). However, no validated instruments in Chile measure aggressive behaviors at preschool age. Pioneering studies of aggression have considered this type of behavior to be a physical and observable act and, therefore, measurable via an observational methodology (Berkowitz, 1993; Bushman & Huesmann, 2010). These tools have also assumed that aggression is a male response resulting from biological differences, skewing research results (Vachon et al., 2014). In contrast, there is currently more interest in studying aggressive behaviors in both genders. As the field of view widened, the study of less visible forms of aggression and of aggression in both genders began in earnest, revealing greater diversity (Björkqvist & Niemelä, 1992; Lagerspetz et al., 1988; Nivette et al., 2014).

At the preschool stage, young children are less likely to naturally inhibit their hostile or aggressive behaviors in the presence of adults and are therefore more likely to initiate and maintain aggressive behavior patterns even when being observed by their educators. This allows teachers to act as valid informants of this behavior (Coie et al., 1990; Crick, 1996). Due to the characteristics

of pre-school education and the style of interactions among children, preschool teachers are thus key and valid informants about children's social behavior (Coie et al., 1990).

The Preschool Social Behavior Scale-Teacher (PSBS-T) Scale

The tool validated in this study is the Preschool Social Behavior Scale-Teacher (PSBS-T). It evaluates physical and relational aggression in preschoolers corresponding up to six years (Crick et al., 1997). This scale was validated and adapted from the tool designed to assess aggression and prosocial behavior in school-age children (Children's Social Behavior Scale-Teacher Form; CSBS-T; Crick, 1996).

PSBS-T has previously been used in other studies to compare different contexts of aggression (Ostrov & Keating, 2014), evaluate prevention programs (Kim et al., 2011), determine the continuity of physical and relational aggression (Ostrov, 2010) and validate scales in preschool population (Fehr & Russ, 2014) as well as assess the effects of violent media and video games on aggressive behaviors. However, there is currently no version of this scale that has been adapted for the Chilean context. Therefore, the purpose of this study is to adapt and provisionally validate the Preschool Social Behavior Scale-Teacher (PSBS-T) scale to evaluate physical and relational aggression in preschools in kindergartens and local schools in an urban commune in Chile.

Methods

Participants

The final sample was 538 children from 3 to 6 years old, as described in Table 1. The sample was selected from one urban community in Santiago of Chile using a convenience sampling design from public elementary schools and kindergartens in the community. The inclusion criteria were to belong to that urban community, from the public system, and be willing to participate in the study. Therefore, we collected data from five Elementary schools and

four Kindergartens using 12 teachers as student informants. Teachers were selected considering more than 3 months in the job, and students more than two months attending to classes.

Table 1
Sample Distribution by Gender and Age

	Age				Total
	3 years	4 years	5 years	6 years	
Boys	62	75	112	35	284
Girls	44	86	93	31	254
Total	106	161	205	66	538

Tool

PSBS has a version for teachers and another for parents. In this study, the version for teachers was used exclusively. This version uses a Likert scale with 5 types of answers: 1: “never or almost never”, up to 5: “always”. The scale contains 25 items grouped into 6 subscales: (1) Relational aggression, with 8 items (4, 8, 11, 13, 15, 19, 21, and 22), including “The child tells a classmate that he/she will not play with him/her unless he/she does what he/she wants”; “The child tries to make his/her classmates dislike another partner by saying bad things about him/her behind his/her back”; (2) Physical aggression, with 8 items (2, 5, 7, 12, 14, 17, 20, and 23), including: “Child kicks or punches peers”; “Child pushes peers”; (3) Pro-social behavior, with 4 items (1, 3, 6, and 10), including “Child is good at sharing and respecting turns”; and (4) Depressive affection, with 3 items (9, 16, and 18), e. g. “Child doesn’t have much fun”. The last two subscales are composed of a single item each: (5) Acceptance of the child by peers of the same gender (“The child is very well liked by peers of the same gender”, item 24); (6) Acceptance of the child by peers of the opposite gender (“The child is very well liked by peers of the opposite gender”, item 25).

Procedure

The first step in the validation procedure was the linguistic adaptation of the instrument

through the back-translation approach (English-spanish-english) of the language by bilingual professionals (Hambleton et al., 2004). Based on this Spanish version of the instrument we developed a content validation of the instrument based on the expertise of three judges with an academic background on the topic in Chile. Two of them are academics from Chilean universities and the other is a practitioner from the Minister of Education. Experts’ judge suggestions were focused on a few grammatical gender distinctions, keeping all the rest of the items from the original instruments. Subsequently, a pilot study was carried out with a sample of two classes from a single educational establishment, with 30 students in each class. In general, no problems were reported with the comprehension of the items, except for one (item 15: “This child tells a peer they won’t be invited to their Birthday party unless he/she what the child wants”). Based on the pilot application, we edited item 15 related to birthday party invitations that were hard to understand for the Chilean sample.

Moreover, informed consent was obtained from each student. Finally, the application of the scale took place between August and September 2014 by one professional running the study.

Data Analysis

To evaluate the factor structure of the PSBS-T, a Confirmatory Factor Analysis (CFA) was carried out comparing the original structure of four factors (defined by items 1 to 23). However, two original factors were defined by only one item; therefore, only four factors from the original scale were compared.

Given that the scale items are answered with ordinal-type response options, and the assumption of multivariate normal distribution is not fulfilled, the polychoric correlation matrix was obtained and the parameters of the models were estimated using the Weighted Least Squares Mean and Variance adjusted method (WLSMV). The previous procedure allows obtaining a robust modification of the quality statistics of the fit of the analyzed model, as

well as adequately estimating the parameters and their standard errors. Since the study participants belonged to different courses, the standard error produced by the grouping (intraclass correlation) was controlled by means of an adjustment obtained by including the students' course as the *Cluster* variable. The quality of fit of the analyzed models was carried out based on the following statistics: a) χ^2 , b) CFI, c) TLI d) RMSEA and its 90% confidence interval. As indicative criteria of a good fit for a model, a non-significant χ^2 statistic, values of 0.95 or higher for CFI and TLI, and a value less than 0.08 for RMSEA have been proposed (Hu & Bentler, 1999). These analyzes were carried out using the Mplus 8.4 software.

Once the model that best fit the data was identified, the invariance of the scale measurement between men and women was analyzed. For this, a Multi-Group Confirmatory Factor Analysis (MG-CFA) was performed and it required the comparison of a sequence of three models. *Model 1: Configural invariance.* This model specified the same factor structure for each group, but the estimation of thresholds and factor loadings were freely estimated in both groups. *Model 2: Metric invariance.* In this model, all factor loadings were constrained to be equal across groups, while thresholds were freely estimated excepting those that required constraining to be equal across groups to allow identification of the model. *Model 3: Scalar*

invariance. All factor loadings and thresholds were constrained to be equal across the two groups. To assess the measurement invariance hypothesis, the sequence adjustment level of the previously described models was compared. A statistically significant reduction in the quality of fit between two models indicates the existence of differences in some parameters between the compared groups. Given that each model in the sequence was nested in the previous model, two comparisons were made, Configural vs Metric, and Metric vs Scalar. To assess the statistical significance of the differences in fit quality, the DiffTest option of the Mplus 8.4 software was used. A non-significant result in these comparisons supported the measurement invariance hypothesis.

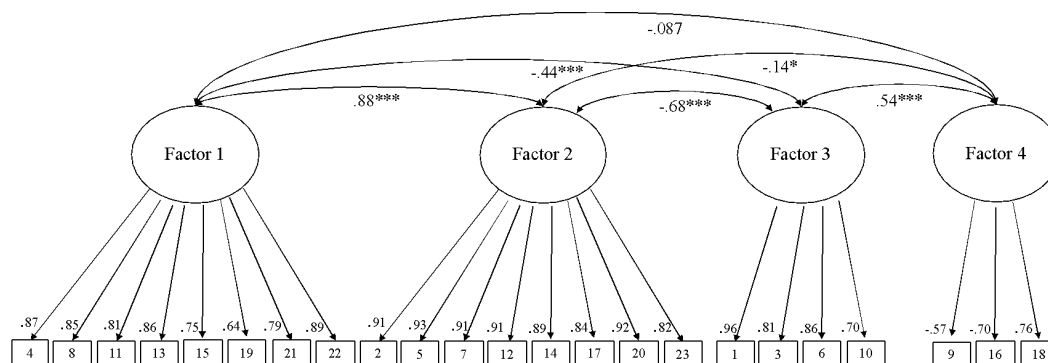
Results

Confirmatory Factor Analysis

The fit quality results for the four-factor model were $c2(224) = 496.158, p < 0.001, CFI = 0.963, TLI = 0.958, RMSEA = 0.048$ (90% CI: 0.042-0.054). For the factor loadings, absolute values in the range 0.57 to 0.96 were observed, all statistically significant ($p < 0.001$). Taken together, these results provide evidence regarding the adequacy of the four-factor model. The reliability Omega coefficients were: F1: 0.88; F2: 0.93; F3: 0.84; and F4: 0.63. The estimated parameters for this model are presented in Figure 1.

Figure 1

Four Factor PSBS-T Scale Model



Note. Factor 1: Relational aggression; Factor 2: Over/Physical aggression; Factor 3: Prosocial behavior; Factor 4: Depressed affect. *: $p < 0.05$; ***: $p < 0.001$.

Multi-Group Confirmatory Factor Analysis

Once the factor structure for the PSBS-T scale was established, an analysis of the invariance of the measurement according to gender was performed. For this, the adjustments of a sequence of three

models were compared, each one more restrictive than the previous one in terms of the invariance of its parameters. The results of these analyzes are presented in Table 2.

Table 2

Results of the Configural, Metric and Scalar models for the PSBS-T scale (N = 528)

	(gl) p-value	a (gl) p-value	RMSEA (90% CI)	CFI	TLI
Configural	808.021 (448) $p < 0.001$	¾	0.055 (0.049, 0.061)	0.966	0.962
Metric	827.462 (467) $p < 0.001$	22.974 (19) $p = 0.24$	0.054 (0.048, 0.060)	0.966	0.963
Scalar	861.978 (531) $p < 0.001$	67.024 (64) $p = 0.37$	0.049 (0.043, 0.054)	0.969	0.970

Note: A comparison of the fit quality of the model sequence was performed using the Difttest option in Mplus.

As seen in Table 2, the comparison of the fit of the Configural and Metric models ($\Delta\chi^2=22.974$, $p = 0.24$) provides evidence in support of the hypothesis of equality of factor loadings for men and women. Thus, these results support the hypothesis of sex. Similarly, the results of the comparison in the adjustment of the Metric and Scalar models ($\Delta\chi^2 = 67.024$, $p=0.37$) provide evidence for the hypothesis of equality of the factor loadings and thresholds between men and women. Thus, these results support the hypothesis of scalar invariance across sex. Taken together, these results provide evidence for the measurement invariance hypothesis between men and women for the PSBS-T scale.

Once the existence of measurement invariance between men and women (particularly scalar invariance) was established, the differences in the means of the four factors for these groups were estimated. The results indicated that men exhibited lower levels in Factor 3 ($\Delta[\mu_{Male}, \mu_{Female}] = -1.248$, $p = 0.03$). No statistically significant differences were observed in the remaining three factors.

Discussion

The results of this study confirm the validation of the PSBS-T scale for use in Hispanic urban populations for 3 to 6 years old children, but only

with four factors. We did not include the items 24 (“The child is well liked by peers of the same sex”) and 25 (“The child is well liked by peers of the opposite sex”) considering the need of at least two items to create a factor. Nevertheless, the other four factors provide acceptable fit measures to validate the instrument for Chilean children.

Moreover, gender invariance analysis corroborated the hypothesis regarding possible gender differences for prosocial behavior (factor 3). In other words, when comparing a boy and a girl with the same levels of the factor, the score will be higher for girls. This confirms the results of other studies regarding differences between men and women, even at early ages, in prosocial behavior (Archer & Côté, 2005).

Having tools to measure (Contreras Bravo & Reyes Lagunes, 2009) aggression at an early age is of the utmost importance (Major & Seabra-Santos, 2014). The early detection of aggressive behavior patterns in boys and girls is key to preventing and treating social and behavioral adaptation problems in children. Research in child development has shown that efforts to prevent aggression and development-related problems should begin in early childhood, when learning to control aggression is a developmental normative task, rather than

waiting until the child enters elementary school, when the problem manifests itself in proportion to its clinical relevance (Vlachou et al., 2011). Similarly, early identification supports at-risk students. This is because, when these aggressive behaviors arise in early childhood, they are very stable and predictive of negative outcomes given that approximately half of the children identified with behavioral problems during preschool education continue to show this pattern during childhood and adolescence (Vachon et al., 2014).

This study had some limitations that must be considered. On one hand, the cross-sectional nature of the data partially limited the analysis by incorporating the time variable as a means of observing variations of this scale. In addition, the data corresponded to an urban community in the city of Santiago, and it is possible to hypothesize that this behavior may vary in other contexts. Moreover, we used a convenience sample design in the study that must be considered for interpreting the results. Future studies can replicate the study with other sampling designs and populations. Despite these limitations, this study represents a significant contribution by being the first study aimed at creating and adapting tools and measurements in preschool populations to the Chilean context.

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