Individuality and Self-regulation in Preschoolers

Carolina Soledad Fracchia, Federico Giovannetti, Juan Gili, Matías Lopez-Rosenfeld, María Julia Hermida, Lucía María Prats, María Soledad Segretin, Sebastián Javier Lipina

Abstract
Different ways of solving planning and spatial working memory tasks generate different task-performance profiles. Tests were administered to 346 (planning) and 427 (spatial working memory) Argentinean children from different socioeconomic (SES) backgrounds. A cross-sectional design was performed to explore eventual variable profiles of performance that were associated with levels of success or failure on tasks that tapped working memory and planning demands and to evaluate their association with SES backgrounds. The results showed that (1) different task-performance profiles were identified: decreased, changeless, oscillated, or increased; (2) the total score for the tasks was significantly different among these profiles; and (3) there were significant differences in the total score among SES groups, which depended on type of profile. These findings suggested the importance of studying individual differences in the performance of tasks that demand self-regulatory processes of children with SES disadvantages. This is important for the understanding of how children solve problems, and how that behavior varies according to SES.

Keywords: Self-regulation Processes, Task-performance Profiles, Socioeconomic Conditions, Preschool Children

Individualität und Selbstregulation bei Kindergartenkindern

Zusammenfassung
Aufgaben zum Planen und zum Arbeitsgedächtnis können verschiedenartig gelöst werden. Argentinische Kinder mit unterschiedlichem sozioökonomischen Status (SES) haben Planungsaufgaben (n=346) und Aufgaben zum visuellen Arbeitsgedächtnis (n=427) gelöst. In einem Querschnittsdesign wurden Lösungsprofile identifiziert und in Verbindung mit dem SES gebracht. Die Ergebnisse zeigten: (1) es gibt unterschiedliche Lösungsprofile: abnehmend, gleichbleibend, oszillierend und zunehmend; (2) die Gesamtpunktzahl für die Aufgaben unterschied sich signifikant zwischen den Lösungsprofilen; (3) die Leistung unterschied sich zwischen den SES-Gruppen in Abhängigkeit der Lösungsprofile. Diese Ergebnisse unterstreichen die Wichtigkeit der Betrachtung individueller Unterschiede in der Bearbeitung von Aufgaben, die Selbstregulation erfassen. Das ist bedeutsam, um zu verstehen, wie Kinder diese Aufgaben lösen und wie sich ihr Verhalten in Abhängigkeit des SES unterscheidet.

Schlagwörter: Selbstregulation, Lösungsprofile, Sozioökonomische Bedingungen, Kindergartenkinder

1 Introduction

1.1 Research questions

In recent years, there have been advances in the research on self-regulation processes and the individual differences in solving tasks that demand them (*Eggert* u.a. 2013; *Yin* u.a. 2015). Studies of cross-sectional and longitudinal (e.g., interventions) assessments usually investigate the impact of different experiences in children´s performance by analyzing the total scores of self-regulation tasks; they rarely consider the important role of individual differences that are based on the ways that children use to solve these tasks (*Blair* u.a. 2015; *Raghubar/Barnes/Hecht* 2010; *Reineberg* u.a. 2015). Considering that the total score obtained in a task does not provide an explanation of what happens during the task's resolution, it is essential to study the association between self-regulation processes and task-performance profiles (i.e., individual differences in the ways children solved the tasks). These results would be useful not only to deepen the basic knowledge of development of self-regulation, but they would also be useful for the study of learning strategies, and for the design of educational and cognitive interventions (*Clark/Dumas* 2016). Furthermore, given that environmental experiences may modulate the development of self-regulation, we consider it essential to discover if there is a relationship between SES factors and the development of such processes (*Hackman* u.a. 2015; *Leonard* u.a. 2015; *Lipina* u.a. 2013; *Tomalski* u.a. 2013).

In this paper, we analyzed how the abilities of planning and spatial working memory were associated with different task-performance profiles. To do that, we analyzed how children solved each trial during assessments of tasks. For this purpose, the research questions that guided this study were: (1) Can we identify different performance profiles during the resolution of tasks that demand working memory and planning processes in preschool children? (2) Is there a relationship between the eventual variable profiles and total scores? (3) Do SES factors modulate both aspects of performance (profiles and total scores) and, in cases where they do, do they modulate in similar or different ways?

1.2 Review of literature

1.2.1 Self-regulation

Self-regulation processes refer to a multidimensional construct that involves motivational-affective, social, and psysiological aspects that are involved in the performance of everyday, goal-oriented tasks (*Sokol/Müller* 2007). These processes can be defined as a complex set of cognitive abilities that are involved in the regulation of thoughts, emotions, and actions. In this sense, self-regulatory processes are involved in almost every daily activity in most cultures worldwide, including social behavior and learning processes from very early stages (*Moffitt* u.a. 2011; *Posner/Rothbart/Tang* 2013). This paper is focused on two specific cognitive self-regulatory processes: spatial working memory and planning. Although planning can be defined as the ability to solve a problem by creating a strategy and an action plan that consist of the execution and evaluation of different steps (*Debelak* u.a. 2015; *Shallice* 1982), spatial working memory is the ability to maintain and handle information regarding the location of an object (*Huang/Klein/Leung* 2016; *Pickering* 2001).

Likewise, there is also an association between life experiences and self-regulatory processes, because the early development of these skills could be susceptible to environmental influences, such as home and school experiences (*Rao* 2010; *Ursache/Blair/Raver* 2012; *Vernon-Feagans/Willoughby/Garrett-Peters* 2016). Self-regulation plays a role in the functioning that leads to academic success in elementary and middle school (*Blair* u.a. 2015; *Raghubar/Barnes/Hecht* 2010; *Weiland/Yoshikawa* 2013). Furthermore, it is well established that unfavorable early experiences (e.g., childhood poverty) can modulate children's academic outcomes and the emergence and development of different aspects of self-regulation (*Bradley/Corwyn* 2002; *Brooks-Gunn/Duncan* 1997; *D'Angiulli/Lipina/Olesinska* 2012; *Lipina/Colombo* 2009; *Lipina/Posner* 2012; *Luby* u.a. 2013; *Ursache/Noble/Blair* 2015). Specifically, there is an association between low SES and performance in tasks that require attention, planning, and working memory in infant, preschool, and school-age children (*Farah* u.a. 2006; *Hair* u.a. 2015; *Lipina/Segretin* 2015; *Markant* u.a. 2015; *Rhoades* u.a. 2011). Finally, another important question is what differences are based on gender in the resolution of tasks. New findings indicate that cognitive gender differences are changing. Depending on the characteristics of the tasks, these differences have decreased, remained stable, or increased (*Miller/Halpern* 2014). It is important to note that most of these studies used total scores as dependent variables and they did not assess performance during the tasks.

1.2.2 Exploration of self-regulation and performance during assessments

Recently, there has been increasing interest in the study of individual differences in self-regulation performance (*Manfra* u.a. 2014; *Willems/Herdzin/Martens* 2015). This interest is based not only in improving the understanding of how the different self-regulatory processes develop, but also on the identification of different groups of performers and how this information could be used to improve the design of interventions aimed at optimizing development of self-regulation in children from disadvantaged backgrounds (*Fatzer/Roebers* 2013*; Miyake/Friedman* 2012*)*. In addition, this approach could enrich the analysis of the gradual integration of the self-regulatory processes with strategies for learning skills that are developed and implemented during development of child cognition (*Chevalier* u.a. 2014; *Purser* u.a. 2012; *Roscoe* u.a. 2013). For example, *Schmittmann/Van der Maas/Raijmakers* (2012) revealed that performance in attentional control and spatial working memory tasks predicted the probable use of different learning strategies. *Purser* u.a. (2012) found an association between visuo-spatial memory tasks and route-learning performance, which was mediated by attention, inhibitory control, and long-term memory. Furthermore, *Chevalier* u.a. (2014) showed that strategies for carrying out working memory and planning tasks changed throughout childhood. Children used more reactive strategies during preschool years, but became planners to a greater extent from the age of 7 onward. Furthermore, self-regulation processes and learning strategies have been shown to vary among individuals, which generated different task-performance profiles (*Christian* u.a. 2015; *Dunlosky* u.a. 2013; *Posner/Rothbart* 2007; *Van Noordt/Segalowitz* 2012). These studies approached the association between self-regulatory processes and learning strategies. The typical approach to measure self-regulatory performances uses mean values at a sample level. For this reason, the main contribution of our study is to consider trial by trial analytical methodologies to build curves of performance to show changes in the child's level of success through time. Finally, to our knowledge, there are no published studies that analyze the association between trial-by-trial performance in self-regulatory tasks and SES factors.

2 Objective and hypothesis

To contribute to the analysis of the association between self-regulation processes and task-performance profiles in the preschool period and their modulation by SES factors, the main goals of this study were (1) to identify different task-performance profiles when performing planning and spatial working memory tasks in a socioeconomically diverse sample of Argentinean preschool children; (2) to examine the relationship between task-performance profiles and the total scores in two self-regulation tasks; and (3) to analyze the modulation of such profiles according to SES factors, such as unsatisfied/satisfied basic needs homes (UBN/SBN, respectively) and gender.

In the context of the literature in this area, we propose the following hypotheses: (1) different profiles will be identified based on the analysis of trial-by-trial performance in spatial working memory and in planning tasks in preschool-aged children; (2) trial-by-trial analysis will allow the identification of more sub-groups of performers in comparison with one based on total score analysis; (3) the total score and the task-performance profiles based on trial-by-trial analysis will be modulated by SES factors. We expected that children living in families with high-SES backgrounds will have higher scores and more successful trial-by-trial task-performance profiles than children from low-SES backgrounds (*Lipina* u.a. 2013; *Segretin* u.a. 2014; *Segretin* u.a. 2016). Finally, based on the literature and our results in previous studies with the same tasks, we do not expect differences due to gender.

3 Method

3.1 Participants

In the planning task, the sample was 346 healthy Argentinean children (160 girls; 186 boys) aged 3-5 (M = 4.10; SD = 0.78). In the spatial working memory task, the sample was 427 healthy Argentinian children (201 girls; 226 boys) aged 3-5 (M = 3.95; SD = 0.82). The differences in sample size were because some children could not resolve the pre-test that is the practice trials. The sample was recruited from official childcare centers in the city of Salta (Argentina) in 2005 (Province of Salta Government Department for Children and Families) by applying a conglomerate sampling method. Families whose children attended these institutions were from different SES backgrounds (Table 1). Informed consents were obtained from parents/caregivers, and ethical approval was obtained from the Ethical Review Committee. The study was conducted according to APA's ethical standards, international and national children's rights and research regulations and procedures, and was approved by the IRB 246.

Table 1: Socioeconomic information

	n	Percentage	Mean (sd)
Age[1]	461	–	4.21 (0.80)
Gender	–	–	–
Male	248	53.80	–
Female	213	46.20	–
Unsatisfied Basic Needs homes	203	44.03	–
Satisfied Basic Needs homes	257	55.73	–
Parent education level[2]	422	–	7.51[3] (2.95)
Housing	422	–	10.02[4] (2.16)
Overcrowding conditions	422	–	6.45[5] (2.44)

Note: The information is from all children who were exposed at least to one of both tasks. 1Age at the beginning of the school year; 2Highest educational levels reached by parents; 3incomplete secondary school level, 4scale range: 3 to 12 points, with higher scores for better housing conditions, 5scale range: 0 to 9 points, with higher scores for better conditions.

3.2 Design and procedures

3.2.1 Cognitive assessment procedures

Children were tested individually at school in a quiet testing room. Tests were scheduled according to teachers' convenience so that they did not interfere with regular meals and activities. Examiners were blind to the objectives and hypotheses of the study. For assessments, children took practice trials, which were considered as pre-tests (if children answered incorrectly to more than half of the practice trials, the task was interrupted).

Two non-verbal cognitive manual tasks were considered for the present study: The Tower of London (TOL) task (*Berg/Byrd* 2002; *Shallice* 1982) was used to assess planning processes. It required the implementation of organizational processes, plan initiation, and maintenance. Each exercise block included five trials in which the child was required to reach a goal configuration of three colored balls from an initial configuration, following a set of rules that included moving one ball at a time, and using a minimum number of movements. Any colored ball could be placed on top of any other, and children had to generate the appropriate action sequence to reach the configuration model. Levels of difficulty were ordered by the number of movements the child required to reach the configuration model. The number of movements increased every five trials. Difficulty levels included exercises with 1-9 movements that were divided into sets of five trials. Because the criterion for finishing the assessment was three consecutive errors, the number of performed trials for each child varied according to their own performance. Table 2 shows the descriptive statistics of the number of administered trials in each task by SES background. Three different scores were assigned to each trial according to the level of success required to solve it: (1) children obtained a score of 2 when their performance was totally correct, that is, when they were able to reach the goal configuration with the minimum number of movements required for each level; (2) children obtained a score of 1 when they reached the goal configuration using more movements than those required; and (3) children obtained a score of 0 when they did not reach the goal configuration. A total score was computed as the sum of correct responses multiplied by the level of difficulty (determined by the minimum number of movements necessary to reach the final model), and this score was the dependent variable of interest.

Table 2: Descritive statistics of administered trials by task und SES

	SBN						UBN					
Task	**n**	**Mean**	**(sd)**	**Minimum**	**Maximum**	**Median**	**n**	**Mean**	**(sd)**	**Minimum**	**Maximum**	**Median**
Tower of London	205	10,21	(6,67)	1	32,00	9	141	9,01	(6,08)	1	28	8
Corsi blocks	237	7,08	(4,68)	1	27,00	6	190	6,93	(4,34)	1	29	6

The Corsi Blocks task (*Berch/Krikorian/Huha* 1998; *Huang/Klein/Leung* 2016) was used to assess visuo-spatial working memory. During administration, the child must watch, remember, and reproduce a sequence of lights (from one to eight, lighting time 1000 ms), which are turned on inside a series of boxes that are arranged randomly in the apparatus. Each child reproduces the sequence by pointing to the light-containing boxes. Each block included five trials; difficulty levels increased with the number of lights, and ranged from 1 to 8 possible lights. As in TOL, the criterion for finishing the assessment was three consecutive errors; for this reason, the number of performed trials for each child varied according to their own performances (Table 2). Three different scores were assigned to each trial based on the level of success that was required to solve it. Thus, following the same procedures as in TOL: (1) children obtained a score of 2 when they were perfectly able to reproduce the target sequence of lights (this implied both the lights and the order in which they were turned on); (2) children obtained a score of 1 when they remembered the lights that were turned on, but they could not reproduce the sequence in which they were turned on; and (3) children obtained a score of 0 when they did not remember the lights. A total score was computed as the sum of correct responses multiplied by the level of difficulty (determined by the number of lights to be remembered) and it was the dependent variable of interest.

3.2.2 H Index

To build the performance curves in each task, children's performances in TOL and Corsi Blocks were analyzed on a trial-by-trial basis. Two data sets were generated, one for each task, which contained the information for the level of success in each trial, including all the administered trials. After that, each dataset was analyzed by applying a cumulative sum technique (CUSUM). An indicator, the *H* index, was derived from this method (*Grunkemeier/Jin/Wu* 2009; *Siddiqui/Izawa* 2015), and it was used to build the individual curves. It was the result of a cumulative sum of the answers.

[H = Background + (Actual - x sample)] (1)

The level of success in the previous trial – background –, was added to the difference between the level of success in the current trial – actual – and the mean level of success for the current trial for the sample – x sample. These were calculated for each age group for each task as indicated in equation 1.

3.2.3 Task-performance profiles

Task-performance profiles were built according to the child's performance in each trial (i.e., considering the child's learning throughout the task) to generate subsets of different types of profiles as the end goal (e.g., increasing task-performance profile). To identify common and different task-performance profiles, each curve was classified according to two criteria: (1) Three groups were conformed based on the comparison between each child's H index for each trial, and the *H* index for the previous trial for the same child: (a) at least 60% of the trials were over the previous *H* index; (b) at least 60% of the trials were equal the previous *H* index; and (c) at least 60% of the trials were below the previous *H* index. (2) In over 50% of the trials, the difference in *H* index between the trials (delta *H* index) was: (a) above or (b) below than one standard deviation of the sample. We adopted one standard deviation for the change in *H* index between trials to identify significant changes (at least according to this simple distribution). These two criteria that considered the distribution of the *H* index in the sample, were selected because most of the trials accomplished a requirement (e.g., if more than 60% of the *H* index of the trials were above the previous trial, and more than 50% of the difference between *H* index was above one standard deviation of the sample, thus the curve is *increasing*), and they were selected from the distribution of sampling groups of profiles from descriptive and frequency analysis that we considered appropriated. Based on this classification, four task-performance profiles were created: (1) *increasing*: at least 60% of the trials were over the *H* index for the previous trial, and in over 50% of the trials the delta *H* index was above than one standard deviation of the sample; (2) *oscillating*: at least 60% of the trials were over the *H* index for the previous trial, and in over 50% of the trials the delta *H* index was below than one standard deviation of the sample; or at least 60% of the trials were equal the *H* index for the previous trial, and in over 50% of the trials the delta *H* index was above than one standard deviation of the sample; (3) *changeless*: at least 60% of the trials were equal or below the *H* index for the previous trial, and in over 50% of the trials the delta *H* index was below than one standard deviation of the sample; and (4) *decreasing*: at least 60% of the trials were below the *H* index for the previous trial, and in over 50% of the trials the delta *H* index was above than one standard deviation of the sample (Fig. 1).

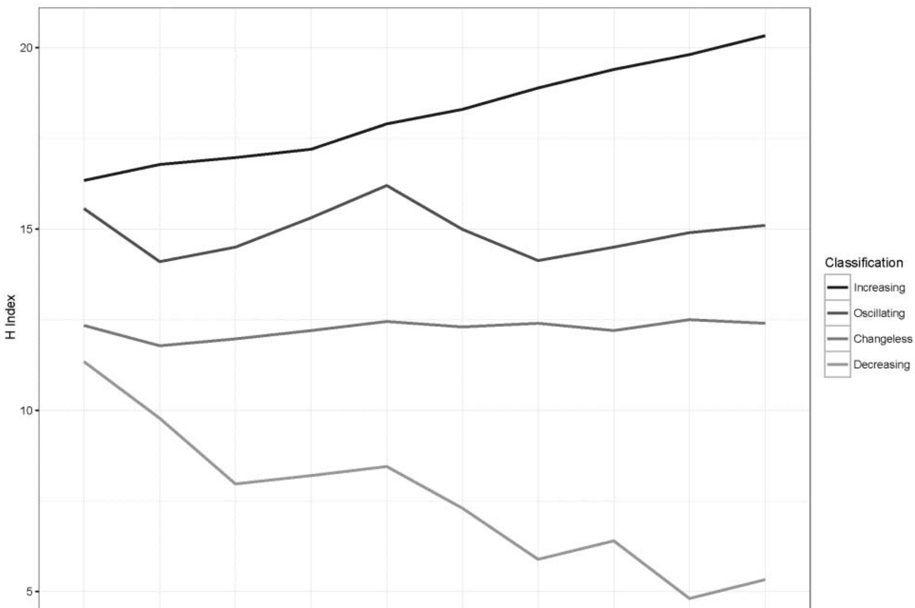

Figure 1: Examples of the four different tasks-performance profiles in the TOL task

3.2.4 Socioeconomic information

The data were collected during the school year (March through November) in a private interview with parents. A SES scale (NES) (*Lipina* u.a. 2005) was used to evaluate parental education levels, overcrowding, housing, and sanitation conditions to identify indicators of unsatisfied basic needs (UBN, poverty criteria; *Boltvinik* 1995). UBN criteria are based on the identification of at least one of the following conditions: (1) inappropriate dwelling (housing) conditions; (2) absence of waste discharge systems in households; (3) overcrowding; (4) presence of school-aged children who do not attend any educational system; and (5) head of household with incomplete elementary school who had more than four dependents. For parental education, only the higher score was considered for the total score. For dwelling, scores were assigned according to type floor, water, bathroom, ceiling, external walls, and home ownership. Based on this information, two groups of studies were generated: children from UBN homes and children from SBN homes.

3.3 Statistical analysis

We used univariate analysis of variance (ANOVA) (with a post hoc Bonferroni analysis test) to assess differences in the total score of the tasks among the four task-performance profiles. Specifically, the analysis included the total score in TOL and Corsi as the dependent variable, the task-performance profiles were the independent variables, and gender and SES group (UBN/SBN) were the covariables. Finally, for comparing differences in SES in the total score within each profile, an UNIANOVA model was implemented for each profile in both tasks. In this model, each profile was analyzed separately, total score was assigned as the dependent variable, and the SES group was the independent variable (TOL and Coris were analyzed in separate models).

4 Results

4.1 TOL

The results of the univariate ANOVA model suggest that the total score was significantly different between the four task-performance profiles (decreasing, changeless, oscillating, and increasing) ($F_{1\text{-}346} = 29.711$; $p < .000$), and between SES groups ($F_{1\text{-}346} = 6.809$; $p < .009$); the SBN group had higher total scores than the UBN group. Descriptive statistics of the four task-performance profiles by task and SES background are presented in Table 3. Finally, gender was not associated with differences in the total score. The Bonferroni analysis showed significant differences between the decreasing profile and the changeless, oscillating, and increasing profiles ($p < .000$). The changeless profile was significantly different from the increasing profile ($p < .002$). Results showed no significant differences between the changeless and the oscillating profiles, or between the increasing and the oscillating profiles (Fig. 2).

Table 3: Descriptive statistics of task-performance profiles by task and SES

	Tower of London				Corsi blocks			
	SBN		UBN		SBN		UBM	
	n	Percentage	n	Percentage	n	Percentage	n	Percentage
Decreasing	27	13,17	25	17,73	8	3,38	3	1,59
Changeless	17	8,29	15	10,62	68	28,69	50	26,46
Oscillating	80	39,02	65	46,10	122	51,48	113	59,79
Increasing	81	39,51	36	25,53	39	16,46	23	12,17

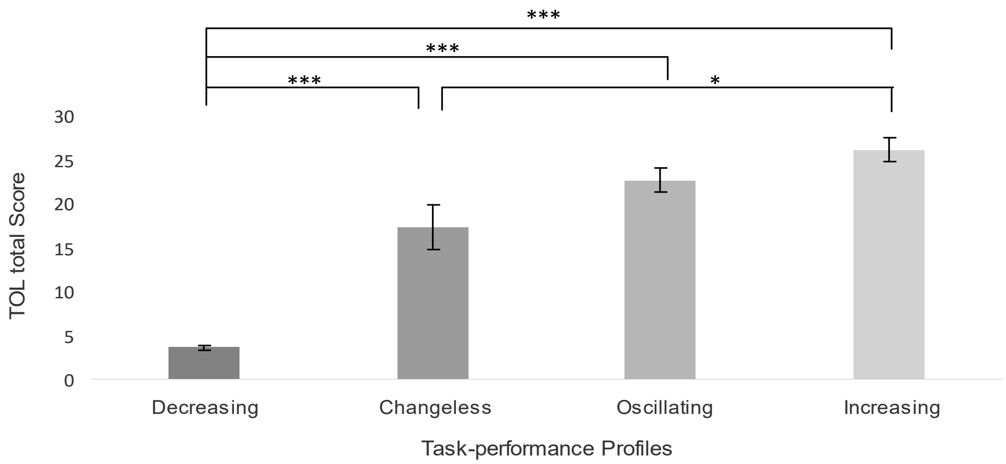

Figure 2: Tower of London total score according to the different task-performance profiles

Note: *p<.05; ***p<.001

The analysis for each task-performance profile that was aimed at identifying differences in the total score according to the SES group showed marginal differences between SES groups only for the oscillating profile (F_{1-145} = 3.681; p < .056). Furthermore, children with different task-performance profiles could have the same total score, but come from different SES backgrounds (i.e., the same or different proportions of children from UBN and SBN homes in each profile could be associated with the same total score) (Figures 3 and 4).

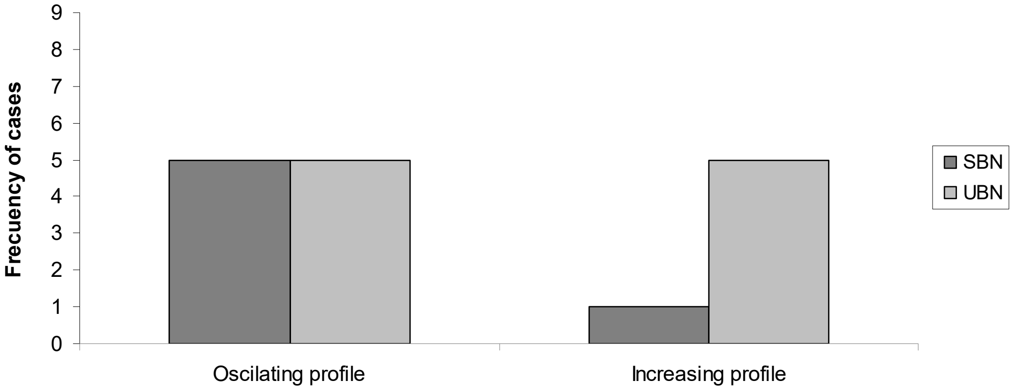

Figure 3: Number of cases by performance profile and SES for total score 11 in TOL (n=16)

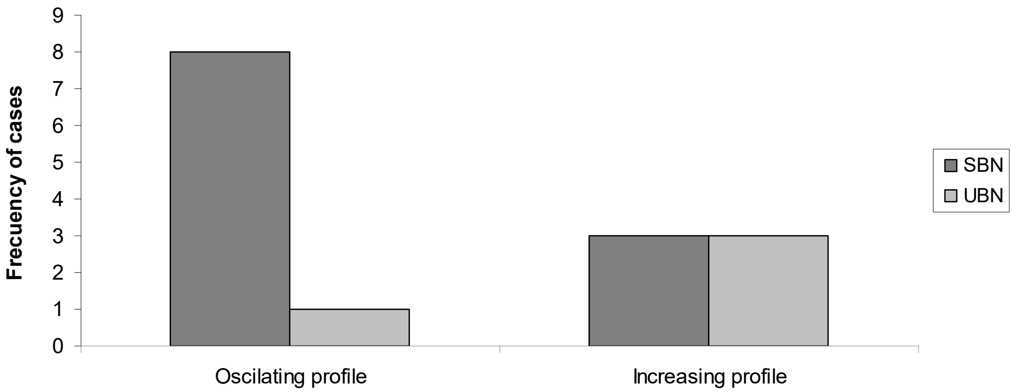

Figure 4: Number of cases by performance profile and SES for total score 21 in TOL (n=15)

4.2 Corsi blocks

ANOVA results showed that the total score was significantly different between the four profiles (decreasing, changeless, oscillating, and increasing) ($F_{1\text{-}427} = 85.000$; $p < 0.000$) (Table 3). Gender and SES groups were not associated with the total score. The Bonferroni analysis indicated significant differences between the decreasing profile and the oscillating and increasing profiles ($p < 0.001$). In addition, the total score for the changeless profile was significantly different from those for the oscillating and increasing profiles ($p < 0.000$). In addition, significant differences were verified in the total score between oscillating and increasing profiles ($p < 0.000$) (Fig. 5).

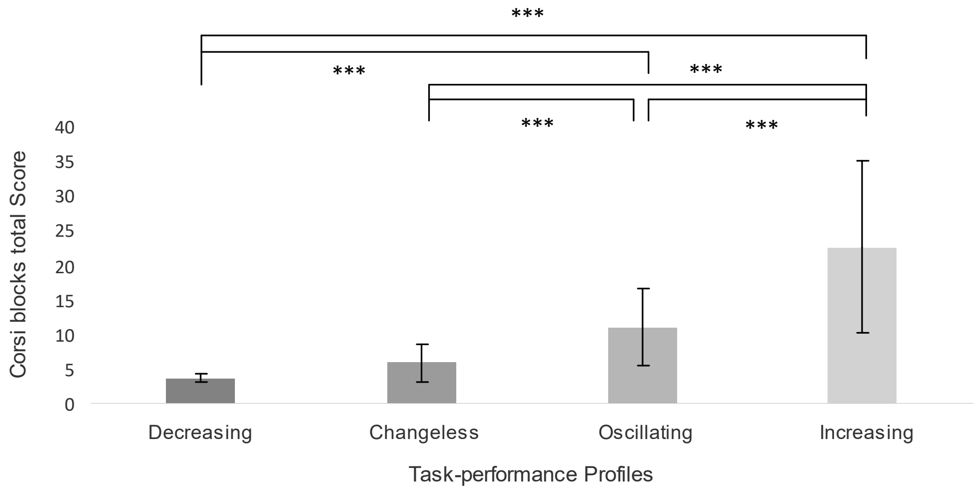

Figure 5: Corsi blocks total score according to the different task-performance profiles
Note: ***p<.001

Finally, results from the comparisons of the total score between SES groups within each profile indicated that the only significant difference was in the changeless profile between SES groups ($F_{1\text{-}236} = 4.135$; $p < .044$). As in TOL, results indicated that children with different task-performance profiles could have the same total score, and yet come from different SES backgrounds.

5 Discussion

The goals of this study were to analyze (1) different profiles of children's performance in self-regulation tasks; (2) the relationship between task-performance profiles and total scores in self-regulation tasks; and (3) the modulation of such profiles according to SES and gender. For that, we analyzed data from a sample of Argentinean children aged 3-5 from different SES backgrounds. Based on these results we can identify different task-performance profiles in TOL and Corsi blocks, and their relationship with SES backgrounds, which provides information that enriches the approaches to interpret individual and environmental differences in self-regulation performance.

In recent years, some studies have begun to examine individual differences in development of self-regulation processess (e.g., working memory and planning). The development of these processess has been studied in relation to a variety of factors based only on general scores (e.g., other cognitive tasks, personality characteristics, SES) (*Eichorn* u.a. 2014; *Keenan/Gunthorpe/Grace* 2007; *Willems/Herdzin/Martens* 2015;), but we proposed another approach for characterizing individual differences (i.e., the *H* index and the task-performance profiles generated based on it). In particular, this approach to analyzing performance included both the individual level of success in previous trials and the mean level of success in the sample for each trial, which considered a reference measure of performance for a similar assessed sample.

The results showed that children's achievement in planning and spatial working memory tasks could be classified into four types of profiles (i.e., decreasing, changeless, oscillating, and increasing). However, different samples showed different trajectories of performance that, in turn, could be modulated by other individual and environmental factors. In our case, the reason for generating these profiles, which represent children´s performance curves, was to assess another way to characterize children's performances that consider both, the final total score and the learning process during the solving of a task. With respect to this issue, results suggested that the total scores and the performance profiles were not equivalent, although they were associated. Specifically, the four profiles that we identified represent different ways of solving the tasks, but the total score did not give us an idea of this process, because identical total scores may belong to different profiles. Results showed that (1) when the total score was higher, the task-performance profiles improved; and (2) when we analyze each profile, we found differences with total scores and the modulation of SES. This suggested that the total score could hide aspects of self-regulatory performance such as different profiles for solving tasks. In this sense, our results showed the importance of exploring how these children acquire knowledge, based on their own profiles in association with their self-regulation processes.

This approach also suggested the importance of analyzing profiles by not relying solely on total scores to explore eventual criteria for designing cognitive and educational interventions that are aimed at optimizing self-regulation (*Diamond/Lee* 2011; *Goldin* u.a. 2013; *Hermida* u.a. 2015). Thus, exploring how a child acquires early learning could be useful for the design of training and intervention studies for different task-performance profiles. The application of the profiles approach in intervention studies should consider the potential changes of the profiles in longitudinal designs, which could vary from the studies that were applied in cross-sectional ones such as this study.

Likewise, the results showed that SES background was associated with total scores for TOL, as was verified in other studies (*Lipina* u.a 2004). However, we did not verify SES differences in total scores of Corsi blocks. Nonetheless, when we analyzed the profiles, we found SES differences in one profile. That is, in TOL only the *oscillating profile* was associated with SES, but in Corsi blocks only the *changeless profile* was associated with SES. It is important to note that children from the SBN group and from the UBN group could be associated with different task-performance profiles in terms of total scores comparisons, and that simultaneously different profiles may have the same score. This is, there is a tendency indicating that the amount of children from both SES groups were distributed equally in the different task-performance profiles (i.e., similar number of SBN and UBN children within each profile). This does not necessarily mean that total scores between SES groups were the same. Therefore, this methodology allowed us to identify specific environmental influences through the analysis of profiles, which suggests that future studies on the influence of poverty on cognition should consider this approach to explore other aspects of self-regulatory processes in cross-sectional settings.

It is important to note that these results should be considered with caution, because it is necessary to explore (a) the application of the proposed analysis of individuality based on trial-by-trial approaches with a more diverse set of self-regulatory tasks (e.g., flexibility, attention, inhibitory control), (b) more diverse samples in terms of individual and environmental factors, and (c) the influences of interventions, to deepen the understanding of the co-integration of different cognitive processes during development and their contribution to learning processes. Research was supported by CONICET, FONCYT, CEMIC, Secretaría de la Niñez y de la Familia (Government of Salta), and Fundación Conectar. The authors would like to thank *Thomas A. Gavin*, Professor Emeritus, Cornell University, for his help in editing the English in this paper.

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