The preschool classroom as a context for cognitive development: type of teacher feedback and children's metacognitive control

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Abstract

Introduction. The aim of this work was to determine whether the type of feedback given by the preschool teacher during class impacts the children's metacognitive control. For this purpose, the children's behavior was analyzed while teachers provided feedback during collaborative learning sessions.

Method. A quasi-experimental, cross-sectional study included two experimental groups and a control group. The age of participants ranged from 4.8 to 5.3 years old; all of them regularly attended a school located in La Pintana, Santiago, Chile. Their educators were trained in delivery of either self-regulation feedback or task/person feedback. While students performed collaborative work related to the Chilean curriculum, educators provided the different types of feedback. A total of 18 learning experiences were videotaped and analyzed using Videograph and SPSS software.

Results. Statistically significant differences were observed between the groups of children that received feedback. A greater number of metacognitive control events were displayed by preschoolers who received self-regulation feedback: in total number of events and in number of events representing each of the three dimensions of metacognitive control (planning, monitoring and evaluation).

Discussion and conclusions. Not all feedback modifies the metacognitive control of preschoolers. Low-cost training in self-regulation feedback and its daily practice equip the preschool teacher to be a key facilitator of children's cognitive development.

Keywords: Metacognitive control; Teacher feedback; Self-regulation; Preschool teaching.

El aula Preescolar como espacio de desarrollo cognitivo: tipo de feedback docente y control metacognitivo en los niños

Resumen

Introducción. El objetivo de este trabajo fue investigar si el tipo de *feedback* docente modifica el control metacognitivo que presentan los niños de nivel pre-escolar, recogiendo evidencia desde el aula y teniendo como foco la observación de los estudiantes en el momento mismo en que trabajan en una tarea de aprendizaje colaborativo.

Método. Se utilizó un diseño cuasi-experimental transversal con dos grupos experimentales y un grupo control. Los niños participantes en el estudio tenían entre 4,8 y 5,3 años y asistían regularmente a un establecimiento de la comuna de La Pintana, Santiago (Chile). Algunas de sus educadoras fueron capacitadas en la entrega de *feedback* de autorregulación y otras, de tarea/persona. Mientras los estudiantes realizaban una tarea colaborativa con contenidos del currículo nacional de la Educación Parvularia, las educadoras les proporcionaban *feedback*. Un total de 18 experiencias de aprendizaje fueron registradas en video y analizadas utilizando los *softwares* Videograph y SPSS.

Resultados. Se observaron diferencias estadísticamente significativas entre los grupos de niños que recibieron distintos tipos de *feedback*, registrándose una mayor cantidad de eventos de control metacognitivo en los niños que recibieron *feedback* de autorregulación tanto para el total de eventos como para cada una de las dimensiones del control metacognitivo (planificación, monitoreo y evaluación).

Discusión y Conclusión. Cualquier tipo de *feedback* no modifica el control metacognitivo de los pre-escolares. La capacitación en *feedback* de autorregulación, sin implicar grandes costos en la práctica cotidiana, potencia al docente preescolar en su rol de promotor del desarrollo cognitivo de los niños.

Palabras Clave: Control metacognitivo; *Feedback* docente; Autorregulación; Enseñanza pre-escolar.

Introduction

For some time, research addressing the capacity for self-regulated learning has observed that from the age of three, children may present early skills having to do with metacognitive control, such as planning, monitoring and assessment, as long as they are in a natural working context and the tasks set them are meaningful and related to their chronological age (Whitebread et al., 2005; Whitebread et al., 2007). This evidence is an express challenge to Preschool Education teachers to promote these types of skills in their students, as part of their learning objectives. The importance of promoting self-regulation skills from an early age is upheld by evidence that relates these skills to greater academic achievement in later years (Torrano & González, 2004; Zimmerman & Schunk, 2001). Similarly, evidence has been found that these types of skills in the first years of schooling can better predict achievement in reading and mathematics than can IQ scores (Blair & Razza, 2007). However, evidence would indicate that preschool teachers in Chile perform poorly in promoting higher thinking skills in their students (Lien Foundation, 2012; Sun, Correa, Zapata & Carrasco, 2011; Treviño, Toledo & Gempp, 2013).

Based on the foregoing, there is a demand for researchers working in the field of Education to find tools to enable preschool teachers to promote certain early self-regulation skills in their students, so that the children can plan, monitor and evaluate their thinking processes while learning, leading them to increasingly independent learning in the school years to follow. As we know, one frequent practice of preschool teachers is to approach the children's tables while they work, and provide feedback related to what the children are doing. We took advantage to intervene in this customary practice, equipping teachers with the specific teaching tool of self-regulation feedback and task/person feedback, so that by means of this teacher-student interaction, they might encourage early self-regulation skills associated with metacognitive control, during their students' daily learning activities.

Quality of teaching practices, metacognitive control and feedback

In present day Chile, Preschool Education is represented in public policy that is being addressed by important players in our society. As examples, the budget was increased in 2013 in order expand coverage in this level of education among the most vulnerable children, and constitutional reform established compulsory kindergarten. While public policies create con-

ditions for progress, the main function of the schooling process takes place inside the schools and the classroom. The effectiveness of the teacher's work behind closed doors is a fundamental factor for improved learning (Bellei et al., 2004, Elmore, 2010; Hattie, 2002; Hopkins, 2008; Treviño et al., 2013).

At the preschool level, the existing evidence on the quality of early education in Chile indicates that there is much room for improvement, especially relating to teaching practices that promote the development of children's thinking and cognition (Lien Foundation, 2012; Sun et al., 2009; Treviño et al., 2013). In this regard, Strasser, Lissi and Silva (2009) carried our research relating to use of classroom time in educational establishments representing different funding types and socioeconomic levels in the metropolitan area. Their results indicate that more than half the day in the sample classrooms was devoted to non-instructional activities such as unstructured play (without adult supervision), snacktime and managing behavior. The authors conclude that the time dedicated to pedagogical activities in Preschool is less than half the day, and that these activities are not oriented to concept development or to language modeling: "the activities that we know to be essential in order for preschool education to have a positive impact on cognitive development and future scholastic performance are notoriously absent from the kindergarten school day in the sample" (Strasser, Lissi & Silva, 2009, p.94). Results were independent of the type of funding and socioeconomic levels represented in the educational establishments that participated in the study.

For their part, Sun et al. (2011) analyzed the results of country-level teacher assessment from the years 2006 to 2009, corresponding to 55,536 teachers[1]. They indicated that educators in general show significant difficulties to hold effective interaction with their students, in a way that would encourage development of higher-level thinking skills. Regarding the interaction quality indicator, which assessed the effectiveness of questions the teacher used to encourage learning, and how well they made use of student interventions (responses or spontaneous comments), the authors note that: "in the classes filmed, most teachers are observed engaging in interactions with their pupils that do not encourage the development of thinking, and do not constitute a significant contribution toward enriching their learning, whether dealing with conceptual or procedural content" (Sun et al., 2011, p.121). This analysis specified that teacher preference was to encourage mechanical execution of a procedure or the repetition of information through questions that did not require elaboration from their stu-

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[1] This assessment included teachers from Early Childhood, Elementary, Secondary and Special Education in the municipal sector.

dents. According to Perticará and Román (2014), the 2012 teacher assessment did not show changes in these results. Figures show that the teacher interaction indicator was the lowest in the portfolio instrument, with less than 20% attainment. At the same time, results from the INICIA[2] test from that same year show that graduates in Early Childhood Education also presented important deficiencies in the areas of pedagogical knowledge, disciplinary knowledge, and written communication skills, obtaining insufficient percentages for achievement in these three areas (62%, 60% and 51%, respectively). These findings are particularly significant if we realize that these same students are currently practicing teachers in the country's preschools and kindergartens.

One more recent study, directly related to teaching practices in Chilean Preschool Education, describes the daily performance of educators who work in at-risk public schools (Treviño et al., 2013). For the first transition level (pre-kindergarten), the *Classroom Assessment Scoring System* (CLASS)[3] was used, focusing on the interactions within the classroom and how teaching practices are organized along three domains: emotional support, classroom organization and pedagogical support. Results overall show that educators have medium-level performance in emotional support and classroom organization, in other words, that Chilean educators are able to maintain an acceptable classroom atmosphere and productivity. However, low-level performance was observed in the dimension of pedagogical support, which is related to the domain of knowing specific teaching methodologies. At the same time, greater attention from the teacher is required in order to effectively interact with the children to promote higher-level thinking skills and cognition. This low performance revealed that the teachers do not adequately manage the use of feedback, among other aspects. In the study mentioned above, quality of feedback was considered to be "the degree to which the teacher's feedback to the children focuses on expanding their learning and comprehension" (Treviño et al., 2013, p.49).

Based on the above evidence, there is a need to prepare preschool teachers in the use of tools that would help them improve the quality of their teaching practices, especially those related to promoting their students' thinking. One teaching tool or strategy often used by

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[2] This standardized, diagnostic, formative and non-certifying assessment for students graduating from university (or soon to graduate), with different types of education degrees, focuses on disciplinary and pedagogical knowledge, within the framework of the *Inicia* Program of the Chilean Ministry of Education. The objective of this program is to improve preservice teacher training.

[3] As indicated by Treviño et al. (2013), CLASS is the product of a long line of research pursuing an ecological model that would enable the analysis of teaching quality of Early Childhood Education classrooms.

teachers on a daily basis, and which, according to the literature, shows a relationship to self-regulation skills, is the giving of feedback (Torrano & González, 2004; Zellermayer et al., 1991). Butler and Winne (1995) developed a model that alludes to the relationship between feedback and self-regulation, indicating that feedback is an inherent catalyst and a primary determinant of the processes that make up self-regulated learning. In their model, they explain how feedback affects students' engagement with cognitive tasks, their forms of participation and their academic achievement. Their hypothesis is that the most effective students develop cognitive routines for creating internal feedback while they are working on academic tasks. They do so, for example, by establishing a plan to generate criteria that allow them to compare actual performance with desired performance as they participate in a task. This monitoring of their participation processes as well as the products of the task creates constant feedback, providing them with the basis for greater engagement. Likewise, the information obtained allows them to reinterpret the elements of the task and thus direct their next behavior, that is, by modifying their participation through setting new goals or adjusting the existing ones, re-examining the strategies used, selecting other more productive ones, etc. These forms of regulation allow students to successfully reach their proposed goal. In this same line, Torrano and González (2004) explain that feedback allows students to mark out reasonable objectives and monitor the degree to which the proposed goals are being met, to register the effectiveness of the strategies being used and make adjustments in effort and in the direction of the strategies, if needed. Similarly, Pino-Pasternak, Basilio and Whitebread (2014) identify pedagogical practices and classroom contexts that promote agency in learning. Among these, they mention the use of classroom dialogue that allows students to get involved in metacognitive discussions, pupil-to-pupil and pupil-teacher.

While the evidence shows a relationship between self-regulation skills and feedback, Hattie and Timperley (2007) concluded, based on evidence collected in their meta-analysis, that certain types of feedback are more powerful than others in terms of one's involvement in learning. According to these authors, feedback with greater impact is that which enables improved task performance and offers strategies that elicit the student's taking greater responsibility for improved learning. By contrast, offering information about the learner would be lower-impact feedback, since it is not linked to task objectives.

Objective and hypotheses

Recognizing a need to improve the quality of teaching practice directed toward preschool students' attainment of learning, the *objective* of this study was to investigate whether the type of feedback provided by the teacher modifies preschoolers' metacognitive control. Toward this end we draw evidence from the classroom, and focus our observation on students at the moment when they are working on a curriculum-related learning task. The proposed *hypotheses* were:

Hypothesis 1: There will be statistically significant differences in the total number of metacognitive control events that the children present as a function of the type of feedback provided by the teacher.

Hypothesis 2: There will be statistically significant differences in the number of metacognitive control events in their three dimensions (planning, monitoring and evaluation) that the children present, as a function of the type of feedback provided by the teacher.

Method

Participants

The investigation was carried out in 2010 in an institution of public education, offering schooling from the first transition level (prekindergarten) through high school (12th grade); the participants were 103 teachers and 2944 students from the community of Pintana, Santiago (Chile). This community consists almost entirely of social housing, with high indicators of vulnerability, poverty, overcrowding, and lack of services, infrastructure and urban facilities. Nine of the teachers, each of whom held a university degree in Education and professional certification as Early Childhood Educator, were invited to participate in the study. Six of them voluntarily agreed to participate. All six teachers were women, between the ages of 26 and 30; their average length of teaching service was 4.3 years, and their teaching load was 30 hours per week.

Drawing from the children enrolled at this school in the second transition level of Early Childhood Education, and who belonged to the classes of the participating teachers, 31 students were pre-selected, such that: i) their age fell within the range from 4 years, 10 months to 5 years, 3 months; ii) they had attended the same school from the first transition

level, in order to ensure that all students were exposed to the same preschool curriculum; iii) their historical average attendance was greater than 80%, in order to avoid any losses due to absenteeism. From this group, six boys and six girls were then randomly selected from three different classes (one morning group and two afternoon groups). The number of four preschoolers per class group was due to the organizational dynamic of the school at that time. Study sampling had three stages: intentional in the first two stages (school and class group) and probabilistic in the third stage (students).

Instruments

The data was collected in the natural context of the research subjects, that is, the classrooms where the children's classes were usually held. While the teachers were leading the learning experiences, one of the researchers took audiovisual recordings with a portable camera. A total of 18 learning experiences were recorded, 6 for each working group, with an average duration of 15'24" each (range: 7'35''- 21'30'').

Variables and measurements

The study's independent variable was type of feedback, understood to be the verbal information delivered by the teacher to the children in each of the working groups (experimental or control) during the development of a learning experience, and referring to performance and comprehension of a task under way. The dimensions of this variable were self-regulation feedback or task/person feedback. The variable was operationalized according to the study by Hattie and Tiemperley (2007), and is summarized in Table 1.

Table 1. **Operationalization of the independent variable: type of feedback.**

SELF-REGULATION FEEDBACK	
Descriptors	- Deliver information that facilitates reflection on how a task will be carried out, is being carried out or was carried out.
	- Deliver information that stimulates reflection on procedures for evaluating quality and progress on the task under way or the final task performance (completed execution).
	- Asks open questions that leave room for more than one response or manner of proceeding.

Example 1	The task consists of cutting and putting in order a sequence of five pictures of how to order a pizza over the phone. The students argue over use of the scissors, they only have one pair, and the teacher intervenes at that moment:
	teacher: children ... How are you going to cut? Is Maria the only one who is going to cut? [the girl who has the scissors]
	students: "no, we are all going to cut"
	teacher: "and how are all of you going to cut?"
	students: "like a team, taking turns"
	teacher: "so who is going to start, then?"
	students: "Carolina, because she is the littlest, girls first and the little ones first".
Example 2	The group of students has now finished the activity of making a caterpillar with circles of three different colors, following an ABC pattern determined by the working group; at this time the teacher approaches the group to intervene:
	teacher: Did you do a good job on the task?
	students: yes
	teacher: and how do you know that it's good?
	students: because look, it has different colors
	teacher: um.. because it has different colors and you could tell me how you made it
	student: look, orange, brown, blue ... [she goes from one end of the caterpillar to the other, and at the last circle of the sequence she realizes that the color she was about to name is not the one that is pasted there]
	teacher: what happened there?
	students: a brown one is missing
	teacher: and what about that blue one? [referring to the wrong circle that is pasted on]
	students: we're going to take it off and put the brown one on instead.
TASK FEEDBACK	
Descriptors	- Informs whether the work is correct or incorrect.
	- Informs about ways to proceed.
	- Informs about whether one should add, take away or correct information referring to the task, in order to improve it.
	- Informs on the degree to which the task has been completed or represented.
	- Verifies understanding of an instruction.
	- Asks questions that generate unique responses.
Example	The task consists of remembering and putting in order a sequence of five cards on how to plan a trip. While carrying out the activity, two children cut and immediately begin to paste the images. The teacher, observing this situation, enters the group and says: "remember, first I cut, put them in order and then I paste"
PERSON FEEDBACK	
Descriptor	- Express comments or phrases of admiration/rejection toward the students.
Example	The task consisted of making a caterpillar with circles in three different colors, following an ABC pattern determined by the working group itself. The group of students does not follow the instructions and the teacher enters the group and insists that the caterpillar should be curved in shape, not straight. At that moment, a student does not follow what the teacher has indicated, and she says: "Victor, it's curved ... I'm surprised [at you]..."

The study's dependent variable is *metacognitive control.* This was operationalized using the concept of metacognitive events, defined as any behavior, gesture or verbalization that indicates processes of planning, monitoring and/or evaluating, either of oneself or others, in the framework of a learning experience. The dimensions of this variable were planning, monitoring and evaluation, operationalized according to the study by Whitebread et al. (2007), and summarized in Table 2.

Table 2. Operationalization of the dependent variable: metacognitive control

Dimension	Examples
PLANNING	The task consists of reproducing a picture of a house made up of different geometric shapes. Before beginning, the teacher approaches and asks the children how they will organize themselves to do the task: *student 1*: "first we put in order and then we stick on" *student 2: "* I'll get the circles and you get the others" *student 3:* "it's better if *we* put them together and you two stick them on"
MONITORING	The task consists of cutting and putting in order a sequence of five pictures of how to order a pizza over the phone. While carrying out the activity, one child begins to stick on a picture that he has just cut out. The teacher approaches the group of children and says: "how will you know if you are putting the pictures in the right order if you are already sticking them on? One student corrects the other one, telling him: "not yet, after they are all cut out"
EVALUATION	The task consisted of making a caterpillar with circles in three different colors, following an ABC pattern determined by the working group. Once the activity was finished, the teacher approached, and the following dialog transpired: *teacher:* "look how your classmate says orange, brown, blue, orange, brown, blue. Why does she do that? What is that for?" *student:* "so we know if we made a mistake, orange, brown, blue ... [she starts naming the colors that make up the sequence]" *teacher:* "right, to know if we made a mistake" *student:* "yes, because if here ... orange, brown, blue and here there is a blue and here there is an orange, we take them off and change them"

Procedure

Training in feedback

The authors prepared one training workshop in self-regulation feedback and another in task/person feedback, using the study by Hattie and Tiemperley (2007) for the theoretical foundation. The workshops consisted of eight face-to-face sessions, each one lasting about 60 minutes. Theoretical and practical activities were combined, in particular case studies (written

or filmed). Two teachers were trained in self-regulation feedback and another two in task/person feedback. Two teachers received no training in any kind of feedback.

Planning the learning experiences

The researchers and teachers together planned the learning experiences, understood as follows: the required tasks were designed according to some particular learning that is expected within the curriculum of Early Childhood Education, second transition level, of the Chilean Ministry of Education. For example, "identify and reproduce patterns represented in objects and in the environment, recognizing stable and variable elements in sequences", "Demonstrate time orientation in everyday situations, using different notions and relations" (Chile, 2001, p. 85). Some examples of learning experiences included in the research were: i) making a caterpillar with circles in three different colors, following an ABC pattern determined by the working group, ii) cutting and putting in order a sequence of five pictures of how to order a pizza over the telephone.

Implementation

The learning experiences in which feedback was introduced were carried out over a period of 1.5 months (4th May to 15th June, 2010), with a frequency of one per week. The teachers in charge of the learning experiences were selected randomly from those who were trained in each type of feedback. The teacher who was not selected was available as a substitute. The same procedure was carried out with the teachers who did not receive training in *feedback*.

Data analyses

The design was a cross-sectional quasi-experiment with two experimental groups and one control group. One experimental group received self-regulation feedback and the other group, task/person feedback. The control group received spontaneous feedback, that is, whatever the teachers did who did not receive training. The groups were formed so as to make the least disruption in the usual organizational and teaching dynamic of the classrooms, which was for four students to sit together at each work table, two boys and two girls. The school principal, teachers, students and their respective guardians gave informed consent for their participation in the study.

Recordings were analyzed by one of the researchers, using Videograph software. The metacognitive events associated with feedback given by a teacher were recorded on specially-designed forms. The analysis of the recordings was validated by expert judgements. Three outside investigators, qualified in the topic at hand, reviewed the recordings. Interjudge consistency was 99% (14 of the 15 fragments evaluated). The unit of analysis was each recorded learning experience, for a total of 18 units (6 for each group).

Given that the quantitative variables did not present normal distribution, the three groups were compared used Kruskall-Wallis's nonparametric test. A value of $p < .05$ was considered to be statistically significant. In order to identify any between-group differences, the Mann-Whitney U test with Bonferroni correction was used as a post-analysis, to control for error associated with simultaneous comparisons. Given that the comparison of three groups involved making three comparisons of pairs (1 vs. 2, 1 vs. 3, 2 vs. 3), a value of $p < .016$ (.05/3) was considered to be statistically significant. Statistical analyses were carried out using SPSS version 18.

Results

Descriptive results

Table 3 quantifies the total metacognitive events according to the type of feedback given, for the total of all learning experiences. A total of 66 metacognitive events were registered. Of these, 63 corresponded to the group of children who received self-regulation feedback, with an average of 10.5 and a mean of 9.0 metacognitive events per learning experience. Far behind these, the next group were the children who received spontaneous feedback, with 3 events, for an average and a mean of less than one metacognitive event per learning experience. The group of children who received task/person feedback did not register any such events.

Table 3. Central tendency and dispersion statistics for all the metacognitive events, according to type of feedback

Type of feedback	n	Sum	Average	Std. dev.	Median
self-regulation	6	63	10.5	6.9	9.0
task/person	6	0	0.0	0.0	0.0
spontaneous	6	3	0.5	0.8	0.0
Total	18	66			

Differential effects

In order to determine whether differences observed between the different types of feedback were significant, the nonparametric Kruskal-Wallis test was carried out (Table 4). Self-regulation feedback was shown to be statistically different from the other two ($X^2 = 14.209$, $df = 2$, $p = .001$).

Table 4. Kruskal-Wallis analysis of total metacognitive events according to type of feedback

Type of feedback	Average Range
self-regulation	15.5
task/person	5.5
spontaneous	7.5

In order to identify which pairs of groups accounted for the differences found on the Kruskal-Wallis test, for the variable type of feedback, a second analysis was carried out using Mann-Whitney's U test for two groups. The analysis revealed statistically significant differences between the groups that received self-regulation feedback vs. task/person feedback *(U = .0, Z = -3.07, p = .002)*. In addition, there were differences between the groups that received self-regulation feedback vs. spontaneous feedback ($U = .0$, $Z = -2.93$, $p = .003$). On the other hand, no differences were found between the groups that received task/person feedback vs. spontaneous feedback *(U = 12, Z = -47, p = .140)*.

After analyzing the metacognitive events by dimension, self-regulation feedback was found to be the type that most elicited planning ($X^2 = 14.5$, df = 2, $p < .001$), monitoring ($X^2 = 10.74$, df = 2, $p = .005$) and evaluation ($X^2 = 6.733$, df = 2, $p < .05$) (Table 5).

Table 5. **Kruskal-Wallis analysis of the metacognitive events by dimensions, according to type of feedback**

PLANNING	
Type of feedback	Average Range
self-regulation	15.42
task/person	6.00
spontaneous	7.08

MONITORING	
Type of feedback	Average Range
self-regulation	14.33
task/person	6.50
spontaneous	7.67

EVALUATION	
Type of feedback	Average Range
self-regulation	12.50
task/person	8.00
spontaneous	8.00

Discussion

According to a document issued by the Chilean Ministry of Education, feedback is "the fuel that the teacher provides, a picture of the finish line that is to be attained, a standard or goal that the student must aim for, thus constituting a point of comparison for his or her work" (Chile, 2006, p.24). This conception of feedback is framed within an assessment model in the line of promoting ways of independent learning. Teaching is to be centered on providing students with specific information so that they can take the steps needed to improve their own learning. "Assessment for learning must necessarily involve the students in the evaluation process, in order to provide them with information about how they are doing and to guide their efforts for improvement" (Chile, 2006, p. 25). In line with the foregong, feedback would be oriented both toward improved learning and to promoting skills that encourage the student's agency in his or her own learning.

The present article investigates the use of feedback as a teaching tool for promoting metacognitive control in preschoolers in a classroom context, adapting it to the normal daily teaching and structural dynamic that take places in their classrooms.

Results from the study show that the type of feedback provided by the teacher makes a difference in the quantity of children's metacognitive control events, and that this difference is in favor of self-regulation feedback. The same result was found for each dimension of metacognitive control: planning, monitoring and evaluation. According to Hattie and Timperley (2007), the information delivered through self-regulation feedback is characterized by stimulating reflection on how a task will be carried out, is being carried out and has been carried out; it encourages reflection on procedures for evaluating quality and progress on the task under way or the final task performance (completed execution); it asks open questions that leave room for more than one response or manner of proceeding. For his part, Piaget (1977), in his studies on the development of consciousness in children, proposes the periphery-to-center law. He describes the process of becoming conscious of one's own action, progressing from the more peripheral aspects of the subject-object relationship, to the more central aspects of the subject's and the object's action. Based on this, offering the child self-regulation feedback might contribute toward moving from more peripheral aspects (using the object inten-

tionally for one purpose and verifying the result obtained) towards more central aspects of the subject's and the object's action (coordination of actions, recognition of the means used, reasons for his/her choice or its modification during the exercise, etc.). The teacher would stimulate, through her intervention, a search for the meanings of actions performed in order to complete a specific task, thereby promoting metacognitive control events in the children -- keeping in mind that in many situations the subjects (generally little children) are able to meet their objective, without knowing how they managed to do so (Piaget, 1977).

In the view of Anne Karmiloff-Smith, who was a student of Piaget, self-regulation feedback could act as scaffolding for the child to make a representational redescription process, either through gestures or in some cases verbal, applying self-regulation skills required in certain tasks (Karmiloff-Smith, 1994). The null impact of task/person feedback on children's metacognitive control events, observed in the present study, is contradictory to what Hattie and Timperley (2007) indicated. These authors affirm that it can be beneficial to deliver information to students about the task they are performing, especially when it helps students to reject erroneous hypotheses and provides clues to help them search strategically for information to complete the specific task. When this type of feedback is used to reduce errors in comprehension, it becomes the pedestal for later information processing and effective regulation (Hattie & Timperley, 2007). On the other hand, feedback about the person who is learning, according to the same authors, can have a positive impact in learning by leading to changes in effort, in engagement and in feelings of efficacy in relation to learning or to strategies that students are using to carry out the task. However, these same authors comment that teachers often mix task feedback with information about the learner, thus diluting the task-related information (Hattie & Timperley, 2007); this is a possible explanation for what happened in the present study. A second aspect that might explain our results on task/person feedback -- an aspect not addressed in this study -- has to do with agreement between the teacher's "saying" and her "doing", while giving the feedback. On occasion, what the teacher indicated orally when she intervened in the group of students, and what she simultaneously acted out, with tones of voice and/or physical actions (writing, pointing, correcting, taking materials out of their hands, etc.) were opposite in meaning. In the recordings, we observed several times that the teacher gave adequate task/person feedback verbally, but that it lost its value because it was accompanied by a gesture that "returned" the control back to the teacher.

Prospects for research

Results from the present study justify future research that inquires further into nonverbal feedback. In other words, the analysis should be expanded to gestures and/or actions that the teacher uses, since these communicate information to the student, and to how these interfere in self-regulation processes. Likewise, it would be interesting to investigate the effect of strategies that combine different types of feedback. One interesting angle for this area of study refers to the relationship between self-regulation and the different disciplinary areas. Veenman et al. (2006) report about the controversy on whether metacognition is a general or domain-specific skill. In this regard, they note: "one topic of particular importance to teachers is whether metacognition is general in nature, or specific to topics and domains" (p.7). In this study, metacognition was considered to be a general skill; however, it could be investigated in specific domains such as mathematics, language arts or sciences. At the same time, one theoretical contribution would be to refine the qualitative analysis of metacognitive events beyond their classification into the classic dimensions of planning, monitoring and evaluation, including categories that, for example, would link them to the learning objective. Finally, given that learning does not take place in a vacuum, it would be interesting to inquire into the link between the metacognitive process and other processes inherent to the subject himself/herself, and to the school context. The DEDEPRO® Model shows progress along this line (de la Fuente et al., 2014).

Possible recommendations for educational practice that may be derived from the present investigation are limited by its quasi-experimental nature, and by the small sample size, in a specific, local reality. Notwithstanding, the preschool classroom is shown to act as a space for cognitive development when the teacher introduces self-regulation feedback into her daily practice, and thereby promotes metacognitive control in the small children. Toward this end there is no need for more involved, costly interventions. Some simple training can make a significant difference.

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