ASSESSING MATERNAL BEHAVIORS THAT SUPPORT CHILDREN'S SELF-REGULATED LEARNING

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Abstract: The aim of the present study was to adapt a measure of maternal scaffolding of children's learning and to examine its relationships with children's self-regulated learning (SRL) skills and cognitive performance in different cognitive domains, such as visual-spatial and language tasks. Thirty-five pairs of mothers-preschool children participated in joint problem solving. Maternal supportive behaviors were examined by means of a structured observation form tapping mothers' Cognitive and Metacognitive Support, Emotional-Motivational Support, and Autonomy Support. The children's actual SRL skills and cognitive performance in the two different cognitive domains were also assessed. The maternal scaffolding instrument's inter-rater reliability was confirmed. A developing and dynamic network of relations emerged between maternal scaffolding behaviors, children's SRL skills and cognitive performance; the cognitive domain of the tasks differentiated these relations. Maternal promotion of children's autonomy was positively associated with children's actual use of cognitive strategies, and with their planning and monitoring skills in both cognitive domains. The implications of the findings for promoting children's SRL in different cognitive domains are discussed.

Key words: Children's autonomy, Maternal scaffolding, Self-regulated learning skills

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INTRODUCTION

Self-Regulated Learning (SRL) includes the learner's abilities and strategies required to monitor and control performance, knowledge, emotions and environment to accomplish their goals (Efklides, Niemivirta, & Yamauchi, 2002; Schunk & Zimmerman, 1994). These skills are strongly linked with significant cognitive benefits in academic settings (Boekaerts, 1999; Borkowski, Chan, & Muthukrishna, 2000; Zimmerman, 2002). Previous studies have shown that students with high SRL skills learn more effectively, present higher levels of learning motivation, are better adapted to school, and achieve higher academic performances (Efklides, 2011; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009; Zimmerman & Schunk, 2008).

Although SRL is not always apparent in younger ages, its development starts very early and becomes extremely important as children grow up and are expected to take the responsibility for their learning (Bronson, 2000). At early ages, parents are valuable contributors to preschool and kindergarten children's growing self-regulation. Previous studies investigated how specific parental characteristics are associated with the development of children's skills for regulating their learning (Bronson, 2000; Neitzel & Stright, 2003; Puustinen, Lyyra, Metsäpelto, & Pulkkinen, 2008). There is evidence that parents contribute to children's growing self-regulation by providing responsibilities in accordance to children's age and skills. This allows children to make choices among different social and cognitive activities, and promote independent learning and problem solving (Bronson, 2000). These early parent-child interactions constitute the beginning of children's knowledge, motivation, autonomy and responsibility, factors that are particularly critical for children to effectively control their skills and regulate their learning process (Neitzel & Stright, 2003).

Parental support of learning and children's learning skills

The way parents give instructions to the child when engaged in learning activities and the emotional support they provide are associated with the independent, self-regulated activity the child shows in learning and problem-solving situations (Johnson, Cowan, & Cowan, 1999; Neitzel & Stright, 2003; Pino-Pasternak & Whitebread, 2010; Stright, Neitzel, & Herr, 2009). Wood, Bruner, and Rose (1976) use the term "parental scaffolding" to describe a type of interaction in the child's zone of proximal development. Lev Vygotsky (1978) described "scaffolding" as the assistance offered to the learner by a more competent adult or peer. This type of interaction comprises instructions, hints and prompts aiming to broaden the child's knowledge, to decrease

task complexity and to gradually transfer the responsibility to the child, while the adult provides emotional support (Stright et al., 2009).

Supporting children during learning can take different forms: *Cognitive support* refers to the assistance offered to the child to understand and to handle the cognitive task or material, such as to analyze and combine information, to find out the key features, to elaborate and organize material, to remember information, etc. *Metacognitive support* refers to any kind of adult/parent assistance that activates the child's metacognition, that is, the ability to organize and plan the steps towards a solution, to select and follow solution strategies, to self-monitor and self-regulate during learning, and to self-evaluate. *Emotional support* refers to the affective and motivational climate that characterises the adult-child interaction during learning, and to the adult's efforts to attract and retain the child's interest and motivation to the task. *Transfer of responsibility* and *autonomy support* refers to the degree to which the adult/parent encourages the child's gradual autonomy and active involvement during problem solving (Neitzel & Stright, 2003, 2004; Zhang & Whitebread, 2017).

Research on parental scaffolding behaviors suggests that the way parents provide cognitive support during problem solving is likely to create cognitive problem-solving models applied by children (Rogoff, Mistry, Goncu, & Mosier, 1993). Indeed, the kind of cognitive support provided by mothers during problem solving is positively related to children's attention skills, conceptual knowledge, academic ability, executive function and methods of working or seeking assistance (Englund, Luckner, Whaley, & Egeland, 2004; Hammond, Müller, Carpendale, Bibok, & Liebermann- Finestone, 2012; Pianta, Nimetz, & Benett, 1997; Stright, Neitzel, Sears, & Hoke-Sinex, 2001). In the same line, children whose parents give appropriate instructions in small steps, concerning the information and the details, as well as metacognitive information, have better spatial and arithmetic skills and are more likely to monitor the process of their learning and mention their way of thinking (Casey, Dearing, Dulaney, Heyman, & Springer, 2014; Mattanah, Pratt, Cowan, & Cowan, 2005; Stright et al., 2001). Moreover, Stright et al. (2009) found that the cognitive support provided by mothers positively predicted cognitive and metacognitive aspects of children's self-regulatory behaviors in kindergarten. Furthermore, the work of Neitzel and Stright (2003) showed that mothers' metacognitive support and the manner of instruction that is, regulating task difficulty, reviewing the steps, discussing progress predicted children's metacognitive skills such as metacognitive talk, monitoring and help seeking.

Emotional support provided by parents during joint problem solving, such as the emotional tone of interaction, the positive mood, and the encouragement offered, are also important. Neitzel and Stright (2003) posited that besides the role of parental

cognitive and metacognitive support in children's SRL skills, parental emotional support is also central, affecting children's work efforts and children's sense of responsibility for their behavior in the classroom. These authors showed that mothers' emotional and autonomy support were linked to aspects of children's emotional and motivational self-regulation. Evidence from other studies indicates that parental emotional support and motivational climate during joint problem solving (e.g., encouragement, positive attitude, praise, sensitivity) were related to the presence of metacognitive speech in children in the third grade, to children's cognitive outcomes, academic skills, delay of gratification, executive function and social skills (Bernier, Carlson, & Whipple, 2010; Leerkes, Blankson, O'Brien, Calkins, & Marcovitch, 2011; Martin & McLellan, 2008; Razza & Raymond, 2013; Stright et al., 2001).

Furthermore, two parental emotional-motivational behaviors, namely, parental reward and criticism, have been associated with children's motivation to continue working on the task and show persistence in difficult tasks as well as with school performance, social and behavioral problems (Johnson et al., 1999; Neitzel & Stright, 2003; Pianta, Smith, & Reeve, 1991). In general, it seems that the way parents respond emotionally during problem solving is associated with children's development of cognition and motivation (Hokoda & Fincham, 1995; Robinson, Goddard, Dritschel, Wisley, & Howlin, 2009; Salonen, Lepola, &Vauras, 2007).

Another important dimension of parental support of learning is the gradual transfer of responsibility from the parent to the child, that is, the support of the child's autonomy and active engagement (Stright et al., 2009). Specifically, it seems that parents who use prompts, questions and hints, encourage children to take a more active role in the learning process, in contrast to parents who simply provide the answer or guide the actions of their children or take up the completion of the project (Neitzel & Stright, 2003). Evidence from other studies suggests that maternal autonomy support was associated with children's higher performance on homework-like tasks, social and academic adjustment, and higher reading achievement (Grolnick, Gurland, DeCourcey, & Jacob, 2002; Joussemet, Koestner, Lekes, & Landry, 2005). Bernier et al. (2010) also concluded that autonomy support was the strongest predictor of children's executive function. In contrast, parental overcontrolling behaviors often have negative outcomes on various aspects of children's adjustment and performance (Barber, 2002). A recent study reported a negative impact of parental controlling behaviors during homework on children's academic performance, especially when children were considered by their mothers as not able to work autonomously (Silinskas, Kiuru, Aunola, Lerkkanen, & Nurmi, 2015). Studies exploring the above effect suggest that parents' controlling instructions (Deci, Driver, Hotchkiss, Robbins, & McDougal, 1993; Gurland & Grolnick, 2005),

parental close supervision of school work, negative parental reaction to academic failure (Ginsburg & Bronstein, 1993) as well as the use of external rewards (Gottfried, Fleming, & Gottfried, 1994) were associated with extrinsic motivation patterns and lower school performance. It has also been shown that parental autonomy support and control were differentially associated with students' mastery and performance goal orientations (Gonida & Cortina, 2014).

Parental, child and contextual factors impact the parent-child interactions during learning. For example, parents' educational background is associated with parents' behaviors and practices during learning and problem solving. Studies have showed that mothers with higher educational background are more responsive and less punitive during parent-child interactions, share metacognitive knowledge with their children, use more problem-solving strategies, engage in more discussion and respond more contingently during scaffolding interactions in comparison to mothers of lower educational background (Hoff, 2003; Neitzel & Stright, 2004; Raviv, Kessenich, & Morrison, 2004). A recent study by Carr and Pike (2012) found that higher maternal education was associated with greater contingent scaffolding behaviors. However, this association was significant only when highly positive emotion parenting behaviors were also present. The relationships between parental educational level and qualities of parental scaffolding need to be further investigated.

Assessment of parental scaffolding behaviors

The kind of parental behaviors practised in learning situations is important for children's developing abilities, learning skills, and academic achievements. Previous studies dealing with parental support focused mostly on socioemotional aspects of parent-child interactions (control, responsiveness, warmth, directiveness, etc.) (e.g., Knollmann & Wild, 2007; Mattanah et al., 2005). Only few studies, however, assessed at the same time different aspects of parental support, such as cognitive and metacognitive support, emotional support, and children's autonomy support, using multi-dimensional instruments. In fact, the various studies have used a host of different conceptualizations of parental support, not necessarily focusing on SRL. Specifically, parental support during learning was assessed (e.g., Casey et al., 2014; Razza & Raymond, 2013) with ratings based on a global analysis of parental supportive behaviors. Different parental behavior features (e.g., maternal stimulation of cognitive development) were evaluated across the entire parent-child interaction. Other recent studies focused on parents' contingent behavior to evaluate parental supportive behaviors (e.g., Carr & Pike, 2012; Hammond et al., 2012; Pino-Pasternak, Whitebread, & Tolmie, 2010).

However, Neitzel and Stright (2003) made a significant advance in relevant theory and methodology when they associated different parental supportive behaviors during problem solving to children's SRL behaviors. Their coding system is based on observation of parental behaviors and includes three dimensions of support, namely, cognitive support, emotional support, and transfer of responsibility to the child. Parental behaviors are rated on a 5-point scale. It seems there is need for a closer and deeper look in parent-child interactions. Further data are needed to capture parental supportive behaviors during actual parent-child interaction in learning situations.

The present study: Aim, rationale, and hypotheses

The aim of the present study was to adapt a measure of parental supportive behaviors during learning based on Neitzel and Stright's (2003) coding system and to investigate the relations between maternal behaviors and children's SRL skills and cognitive performance. The present study assessed different aspects of spontaneous maternal behaviors enacted to support children's learning via structured observation of the participant mothers. Very few studies so far have provided data on the relations between distinct parental behaviors and children's specific self-regulatory skills during actual cognitive endeavors as they take place (see Zhang & Whitebread, 2017). Investigating such relationships can contribute to our knowledge on children's developing self-regulation skills at early ages and on the role parents can play in this development.

Based on the previous literature, the hypotheses of the study were stated as follows. It was assumed that Cognitive and Metacognitive Support behaviors would have moderate correlations with Emotional and Motivational Support behaviors and with Autonomy Support behaviors (Hypothesis 1a). It was further assumed that maternal Cognitive and Metacognitive Support behaviors would be positively related to Positive affective-motivational context and negatively to maternal Criticism-rejection (Hypothesis 1b).

The various forms of maternal behaviors assessed would be differentially associated with children's SRL skills and achievement (Hypothesis 2). Specifically, it was expected that positive maternal behaviors would be positively associated with children's SRL skills and achievement (Hypothesis 2a) while negative maternal behaviors, namely, Criticism-rejection and Overcontrolling, would be negatively associated with children's SRL skills and achievement (Hypothesis 2b).

Finally, it was expected that higher maternal educational level should be associated with more frequent maternal support to the child (Hypothesis 3).

METHOD

In what follows, a pilot study is described firstly. The pilot study aimed at adapting the observation measure for the assessment of maternal support behaviors and at testing the cognitive tasks developed for the purposes of the study. Then, the main study is presented along with the changes in the measures dictated by the pilot study.

Pilot Study

Participants

Nine mother-child dyads participated in this study. There were 5 boys and 4 girls between 4-6 years old (mean age = 5.3 years old). The mothers' age ranged from 30-49 years old. All of the mothers held university or/and postgraduate degrees. The pairs lived in a medium-sized town of central Greece.

Measures

Cognitive tasks
Two kinds of tasks were given to each child to solve by him/herself: Visual-spatial tasks and language tasks. Similar tasks were also given later to be jointly solved by the mother-child pair for the assessment of maternal supportive behaviors. A detailed description of the cognitive tasks is included in the Main Study section.

Visual-spatial tasks
Children were given colored cubes and were asked to reproduce three different patterns of cube assemblies as they were depicted in card models. Next, three new cube assembly tasks were given to each mother-child pair. The mother was told to feel free to support her child when necessary to solve the tasks.

Language tasks
Each child was given six cards depicting heroes, objects, and places. The child was asked to tell a story based on these cards. Children's performance was assessed using three criteria: Logical thinking and coherence of meanings (e.g., connection, consistency, logical sequence of meanings); Vocabulary (e.g., children's verbal fluency, the reporting of all the information depicted in the pictures, the length of the sentences), and Structure of the story (i.e., the story has a beginning, a middle and a closure part). Next, each mother-child pair had to develop a story based on six

new cards depicting again heroes, objects and places. At the beginning, the mother had to look at the cards and start telling a spontaneous story. The child had to continue and finish the story using the rest of the cards. The mother could assist the child when needed. More information about the scoring criteria is given in the Appendix A

Children's SRL skills

The *Strategic Behavior Observation Scale* (SBOS) (Dermitzaki, Leondari, & Goudas, 2009) was used to assess children's actual SRL strategies during problem solving. Children's Cognitive, Metacognitive, Motivational/volitional skills and Autonomy skills during problem solving were assessed in this study. The SBOS is a structured observation tool that uses a 4-point scale to evaluate children's actual SRL skills during problem solving. A more detailed description of the SBOS is presented in the Main Study section.

Maternal supportive behaviors

Neitzel and Stright (2003) proposed an observational coding system to assess parents' supportive behaviors to their child during learning. This observation system focuses on three aspects of parental support: Cognitive Support, Emotional Support, and Transfer of Responsibility.

Cognitive Support comprises behaviors denoting (a) provision of Metacognitive Information, that is, whether the parent provides metacognitive information to the child in a way that reveals the thinking processes required by the problem; and (b) Manner of Instruction, that is, whether the parent provides directions in small discrete steps (Task Difficulty Regulation) as well as the degree to which the parent summarizes the steps of the tasks and discusses the progress in relation to the ultimate goal of the project (Review).

Emotional Support includes assessment of (a) Encouragement, that is, the extent to which the parent provides comfort and support verbally or non-verbally, and (b) Rejection, the extent to which the parent provides redirection in a negative way, criticism, disapproval or disgust, dismissal of the child's efforts, nonverbal gestures of non-support, or other negative or inappropriate reactions to the child.

Finally, *Transfer of Responsibility* is assessed by (a) Parents' Over-controlling, that is, the extent to which the parent exercises control over the child's problem-solving attempts, beyond what appears necessary for the child to complete the task; and (b) Parents' Encouragement of Active Involvement, which refers to the extent to which the parent encourages the child's active cognitive involvement in the problem-solving task.

Maternal behaviors were rated on a 5-point scale ranging from 1 (low) to 5 (high), as suggested by Neitzel and Stright (2003). In the present study, the voice recordings of the nine mother-child pairs were rated by two independent judges as to the various categories of maternal behaviors. The scores of the two judges were compared and, if differences larger than two points occurred in each one of the maternal behaviors assessed in every task (e.g., the first judge gave three points to maternal cognitive support in the first task of the visual-spatial domain and the other judge gave one point to the same behavior in the same task) or if there was a frequent difference of one point in more than four maternal behaviors in a specific task (e.g., the first judge gave one point more compared to the second judge to 5 parental behaviors in a specific task), there was a discussion between the judges to resolve disagreements or misunderstandings about the scoring criteria.

Procedure

The participant mothers and children were recruited from state kindergartens and participated voluntarily in the study. During the individual examination, the child was first requested to work alone on the cognitive tasks and then to solve the tasks under the supervision and the occasional support of the mother. Each meeting was recorded with the permission of the mother and lasted about one hour.

Main Study

Participants

Thirty-five mother-child dyads from state kindergartens participated in the study. Children's age ranged from 4.6 to 6.0 years (M age = 5.5 years, 65.7% boys). Mothers' age ranged from 30-49 years. The mother-child pairs came from a town-capital of a prefecture in central Greece.

The participant mothers formed three groups in terms of educational level: high educational level, that is, holding a postgraduate degree ($n = 7$), medium educational level, that is, holding a bachelor ($n = 15$) and low educational level, that is, holding a secondary education degree ($n = 13$).

Tasks - Measures

Cognitive tasks
Children were asked to carry out different, albeit of similar structure, sets of cognitive

tasks under two conditions: First, individual problem solving and, second, under the supervision of their mother (joint problem solving). However, children's cognitive performance was measured only with the scores obtained in the first condition, that is, the individual problem solving, because the second condition was only meant for the observation of maternal behaviors. Before the individual problem solving, the child was asked to practice with the researcher four examples in the visual-spatial tasks and one example in the language task to ensure that the child understands what s/he had to do.

Visual-spatial tasks

After the pilot study, visual-spatial tasks of gradually increasing difficulty were administered in order to better correspond to the various levels of children's abilities. Each child was given 30 cubes and was asked to reproduce four given patterns of cube assemblies as they were depicted in card-models. The cubes had three different color sides. The tasks required visual-spatial abilities (i.e., the analysis of a visual-spatial model and the synthesis or replication of it). The four different cards represented gradually more difficult models to be constructed by the child, from simpler black and white models to more complicated colored models. Children's performance for each task was calculated as the number of the correct fittings (considering also the color of the cubes). For example, in the first task the child had to compile eight cubes in order to reproduce the model as depicted in the card-model, without considering the colored sides. If the child had placed in the correct place seven cubes the score would be 7 out of 8. The highest score for all the four tasks was 51.

Mother-child visual-spatial tasks

After the pilot study, new more challenging tasks of gradually increasing difficulty were introduced following the respective changes in the individual tasks. Each mother-child pair was given four gradually more difficult cube tasks. The mother was asked to support her child in order to come to a solution, whenever she felt this was necessary.

Language tasks

After the pilot study, a need to better capture the shy children's expressive language abilities emerged. Therefore, two extra language tasks were added in the main study. Therefore, the language tasks included one story-development task and two-picture sequencing tasks. In the story-development task, the child was given six cards depicting heroes (three cards), objects (1 card), and places (two cards). The researcher started saying a story using three of the cards. Then the child was asked to continue and finish the story using the rest of the cards.

In the two tasks on picture sequencing, the child had to put in the correct time sequence four blended cards that represented the steps of a developing story. Next, the child had to tell the story depicted in the cards. Performance for each language task was calculated using three different scores or criteria: Logical thinking and coherence of meanings, Vocabulary, and Structure of the story. Children's performance was rated on a 4-point scale ranging from 1 (*low*) to 4 (*high*). The highest score for the story development was 12 and the highest score for the two-picture sequencing tasks was 24. Examples of the scoring criteria for the performance in the language tasks are given in Appendix A.

Mother-child language tasks

Mothers were asked to start developing a story based on six pictures, and, next, to support their child, when necessary, to complete and finish the story. The pictures had a different content but the same structure as the individual language tasks. Each pair had to construct one story. The procedure of these tasks was similar to the one in the individual child problem solving. In this case, the mother could help her child in the developing of the story whenever she felt it was necessary. Regarding the mother-child picture-sequencing tasks, after the pilot study, two extra picture-sequencing tasks were added, as described in the previous paragraphs. The mothers were asked to support their children, when necessary, to place the pictures in the correct time sequence and tell the story accordingly. Again, the pictures had a different content but the same structure as the individual language tasks. Each pair was engaged in two picture-sequencing tasks.

Children's SRL skills

Children's actual strategic behaviors during problem solving that are indicative of SRL were measured using the SBOS (Dermitzaki et al., 2009). Specifically, six strategic behaviors were assessed as children solved the cognitive tasks: 1. *Cognitive strategies*, such as choosing between substantial and trivial information, analysing and combining activities, etc.; 2. *Planning of the solution process;* 3. *Self-monitoring during problem solving*; 4. *Concentration/interest*; 5. *Persistence in face of difficulties,* and 6. *Working autonomously*. Examples of the scoring criteria are given in Appendix B. Two independent judges rated each child's enacted skills for each one of the cognitive tasks using a 4-point scale from 1 (clear lack of the strategy) to 4 (continuous and systematic use of the strategy).

Maternal supportive behaviors

After the pilot study, there was a need to better conceptually clarify the maternal

behaviors-observation targets and to prepare more clear and precise observation criteria. Moreover, there was a need to better match the specific maternal supportive behaviors assessed with the respective children's strategic behaviors. Therefore, changes and further elaborations were made with reference both to the particular maternal behaviors assessed and the criteria of assessment on the basis of previous tools for assessing children's SRL skills (e.g., SBOS, Dermitzaki et al., 2009). Hence, a revised structured observation scheme was used to record maternal supportive behaviors deployed during joint mother-child problem solving.

Specifically, in the original Neitzel and Stright's (2003) system, "Cognitive Support" includes "Metacognitive information" and "Manner of instruction" (see Pilot Study). In the revised observation system, the maternal "Cognitive Support" comprised a category of its own, including behaviors, such as helping the child to understand and use the cognitive material or helping the child to discern the substantial from trivial information. "Metacognitive Support" formed a second category with three new maternal behaviors assumed to activate children's metacognition (e.g., planning, monitoring and reviewing the steps of the solution process). Aspects of the Neitzel and Stright's (2003) category "Manner of instruction" were incorporated within the Metacognitive Support. Moreover, the original aspect of "Emotional Support" in the revised observation system was renamed as "Emotional and Motivational Support" to additionally include the motivational climate of the mother-child interactions. Finally, the original "Transfer of responsibility" was renamed as "Children's Autonomy Support". Finally, regarding the scoring scale of the revised observation system for maternal scaffolding, it was decided to use a 4-point scale similar to the 4-point children's SBOS in order to make the judgement process more coherent. The observation criteria were adapted accordingly.

To sum up, the observation system assessed eight different supportive behaviors that presumably tap the following aspects of maternal supportive behavior: Cognitive Support, Metacognitive Support, Emotional-Motivational Support, and children's Autonomy Support.

Cognitive Support comprises the adult's hints, clues and prompts offered to the child to understand well the task and its characteristics, to cognitively elaborate the material, to distinguish the critical from trivial information, to analyze and combine information, etc. (e.g., the mother tells the child "Look again at the card, how many cubes do we need?")

Metacognitive Support refers to the adult's hints, clues and prompts aiming to enable the child to strategically plan the activities for achieving the cognitive goal, to effectively implement strategies, to self-monitor the problem-solving process, and to evaluate the cognitive outcome. The specific supportive behaviors assessed were: (a)

Planning (before and during working on the task): It refers to the mother's hints, clues and prompts that support the child to organize steps of action towards a planned solution process (e.g., the mother tells the child "First, which part of the model should you make? ...Let's make this part of the construction"); (b) *Use of strategies* (during the child's involvement with the task): This category of behaviors includes the maternal information, hints, clues and prompts that aim to support the child to generate or/and effectively use specific strategies, techniques. The strategies could be presented as ideas for task management and for improvement of the solution process (e.g., "We should begin with the easier stuff first"), and justifications on what, why, when, and how to use a particular strategy (e.g., the mother tells the child "This construction looks like stairs. The second step has to be placed on the first, so you need a base to build it"); (c) *Monitoring* of progress and *self-evaluation* of the cognitive outcome (during involvement with the task and after its conclusion): It refers to the adult's hints, clues and prompts to support the child to focus on and evaluate the progress made so far in relation to the final goal and to locate own mistakes in order to correct them. It also includes reviewing of the problem-solving process such as when the adult summarises the steps made so far (e.g., the mother tells the child "So far, we've done his ears and nose, now which part of his body are we going to make?").

Another group of maternal supportive behaviors was the *Emotional and Motivational Support*. It comprised two different kinds of behaviors: (a) *Positive affective and motivational context*: This category includes adult behaviors verbal and nonverbal that aim at creating a positive affective and motivational climate during the interaction. For example, the mother uses positive reinforcement that motivates the child and recognition of the child's effort; there is prevalence of positive emotions shown in verbal or non-verbal manner, such as use of encouraging words, positive comments about the work or the child's ability to solve the task, a positive emotional tone of voice, facial expressions, etc. It also includes the mother's efforts to attract and retain the child's interest and motivation towards the task, such as enjoying the process, expressing positive expectations, etc. (e.g., "What a great idea", "You are doing great", "Keep on trying, I know it's hard", "Wow, you are really concentrated on that"); (b) *Negative Criticism – Rejection*: This category captures the prevalence of negative affect in the interaction of the adult with the child and overt or hidden disapproval of the child's actions or choices. It includes verbal and nonverbal behaviors indicating criticism, disapproval, rejection of the child's efforts, such as redirection of the child in a negative way, non-verbal signs of disapproval (e.g., gestures, facial expressions, disgust, negative tone of voice) or other negative or inappropriate reactions to the child (e.g., "You do not pay attention to what I am telling you", "I knew you wouldn't do that").

The last group of behaviors examined was *Children's Autonomy Support.* Two different kinds of behaviors were assessed: (a) *Boosting autonomy and active involvement*: It comprises maternal behaviors that encourage the child's independent involvement in the problem-solving process, use prompts, hints, and questions to help the child discover a next step and/or progress towards the desired solution (e.g., "You can begin the construction on your own and I will help you if you need it", "What do you think you should next?"). (b) *Overcontrolling*: It comprises adult interference to control the child's efforts to solve the task, despite the fact the child can work independently. For example, the mother tells the child what to do, directs the child into her own way or point of view for solving the task and, generally, when the adult imposes own will, or plan, or strategies for the solution of the problem (e.g., "Now, put this cube next to the other, I want to check what you are doing", "Don't ask why, this is the way it has to be done").

Scoring of the maternal observation system. The categories of maternal supportive behaviors were thoroughly described to help the judges discern with sufficient clarity the behaviors included in each category. Detailed examples regarding the scoring criteria are given in Appendix C. Two judges gave their independent ratings on the basis of these criteria for each of the eight categories of maternal behaviors in each joint task on a 4-point scale. The scores reflected the judge's perception of the frequency and quality of each maternal behavior for each one of the visual-spatial and the language tasks. One (1) point was given when the mother did not provide any or very rare support to the child and four (4) points were given when the mother was giving constant and systematic support to the child. The final score for each maternal behavior was the mean of the two observers' ratings. Therefore, there were eight scores for the supportive behaviors for solving the visual-spatial tasks and eight scores for the language tasks.

Reliability of the scoring system. To assess the reliability of the scoring system, the agreement between the first judge (researcher) and an external judge was computed. Both judges were experienced in individual structured observation studies. Before engaging in independent scoring, the two judges jointly scored and discussed trial cases both from the pilot study and from the main study using the scoring criteria. After reaching agreement on these cases, both judges independently scored the rest of the cases.

The intra-class correlation coefficient of the ratings of the two judges for each of the eight maternal behaviors assessed was calculated. For the visual-spatial tasks, the mean intra-class correlation coefficient for the eight maternal behaviors ranged from .96 - .99. For the language tasks, the mean intra-class correlation coefficient for the eight maternal behaviors ranged from .98 - .99.

Procedure

The participants were recruited from state kindergartens and participated voluntarily in the study. The complete examination procedure lasted about one hour and took place at the kindergartens. The problem-solving process and the participants' behaviors were recorded with a voice recorder device after obtaining the mother's permission.

RESULTS

Descriptive statistics and relations between maternal supportive behaviors

Table 1 shows the descriptive statistics for the variables of the study in the visual-spatial and the language tasks. Inspection of the means presented in Table 1 shows that Negative Criticism-Rejection was rated low in both cognitive domains compared to the rest of the maternal behaviors.

Table 1. Descriptive statistics of the variables of the study in the two cognitive domains

	Visual-spatial tasks				Language tasks			
	Minimum	Maximum	Mean	*SD*	Minimum	Maximum	Mean	*SD*
Maternal behaviors								
Cognitive support	1.00	3.87	2.61	.58	1.16	3.66	2.21	.68
Planning	1.00	3.50	2.38	.62	1.33	3.16	2.06	.60
Use of strategies	1.00	3.50	2.46	.54	1.00	3.33	2.00	.64
Monitoring	1.00	4.00	2.66	.65	1.00	3.66	2.10	.66
Positive affective and motivational context	1.00	4.00	2.36	.74	1.00	3.16	2.02	.61
Criticism - Rejection	1.00	2.62	1.69	.46	1.00	2.66	1.51	.49
Boosting autonomy	1.25	4.00	2.67	.70	1.66	4.00	2.61	.50
Overcontrolling	1.50	3.12	2.45	.37	1.00	4.00	2.38	.80
Children's skills								
Cognitive strategies	1.75	4.00	2.86	.66	1.67	4.00	2.76	.65
Planning	1.25	4.00	2.73	.79	1.00	3.67	2.63	.65
Self-monitoring	1.25	4.00	2.74	.80	1.67	4.00	2.71	.60
Concentration	2.25	4.00	3.36	.53	2.33	4.00	3.20	.5
Persistence	1.50	4.00	3.35	.63	2.00	3.83	3.05	.50
Working autonomously	2.50	4.00	3.59	.49	1.33	4.00	3.18	.59
Task performance	14	51	34.0	9.39	16	34	25.16	5.06

Differences between maternal supportive behaviors

Two different within subject ANOVAs were conducted, one for the visual-spatial and one for the language tasks, in order to investigate the possible differences between the different types of maternal supportive behaviors. Three new variables were computed, representing the three groups of maternal behaviors, respectively. Specifically, the eight categories of maternal supportive behaviors were grouped into three sum scores. The first represented the Cognitive and Metacognitive Support (i.e., it was the sum of the cognitive score and the three metacognitive scores) and was labelled *Cognitive Support.* The second sum score represented *Emotional-Motivational Support* and was based on the scores of the Positive affective and motivational Context, and Negative Criticism-Rejection (reversed scoring). The third sum score was based on the scores of Boost for Autonomy - active involvement and maternal Overcontrolling (reversed scoring) and it was labelled *Autonomy Support.*

The results showed that there were overall significant differences between the three different scores in both cognitive domains. For the visual-spatial tasks the multivariate effect was: Pillai's trace = .204, $F(2, 33) = 4.228$, $p = .023$, partial $\eta^2 = .204$. The test of within-subject effects was: $F(2, 68) = 3.589$, $p = .033$, partial $\eta^2 = .095$. The pairwise comparisons were: Cognitive Support ($M = 2.53$) and Emotional-Motivational Support ($M = 2.83$), $p = .021$; Cognitive Support ($M = 2.53$) and Autonomy Support, ($M = 2.63$), $p > .05$. For the language tasks the multivariate effect was: Pillai's trace = .563, $F(2, 33) = 21.250$, $p < .001$, partial $\eta^2 = .563$. The test of within-subject effects was: $F(2, 68) = 14.304$, $p < .001$, partial $\eta^2 = .296$. The pairwise comparisons were: Cognitive Support ($M = 2.09$) and Emotional-Motivational Support ($M = 2.77$), $p < .001$; Cognitive Support ($M = 2.09$) and Autonomy Support ($M = 2.64$), $p = .009$.

Correlations between maternal supportive behaviors

Tables 2 and 3 present the Pearson *r* correlation coefficients for the eight maternal behaviors in the visual-spatial and the language tasks, respectively. Only the significant correlations according to Bonferroni correction are presented.

Regarding the correlations between the maternal behaviors, similar patterns of relations were found in both kinds of performance tasks. Maternal Cognitive and Metacognitive supportive behaviors were highly correlated between them in both the visual-spatial and the language tasks. Interacting in a Positive affective-motivational climate was positively associated with maternal promotion of Planning and Monitoring skills in children in both kinds of tasks. Finally, Boosting the child's autonomy was negatively associated with maternal Overcontrolling, as expected.

Table 2. Pearson's r correlation coefficients between maternal supportive behaviors in the visual-spatial tasks

Maternal Behaviors	1	2	3	4	5	6	7	8
1 Cognitive support	-							
2 Planning	.84	-						
3 Use of strategies	.90	.90	-					
4 Monitoring	.75	.84	.82	-				
5 Positive affective and motivational context		.56	.51	.66	-			
6 Criticism - Rejection					-.55	-		
7 Boosting autonomy							-	
8 Overcontrolling							-.55	-

Note: Correlations are significant at the .006 level (Bonferonni correction)

Table 3. Pearson's r correlation coefficients between maternal supportive behaviors in the language tasks

Maternal Behaviors	1	2	3	4	5	6	7	8
1 Cognitive support	-							
2 Planning	.93	-						
3 Use of strategies	.90	.90	-					
4 Monitoring	.85	.86	.83	-				
5 Positive affective and motivational context	.53	.49		.58	-			
6 Criticism – Rejection						-		
7 Boosting autonomy							-	
8 Overcontrolling	.46						-.81	-

Note: Correlations are significant at the .006 level (Bonferonni correction)

Relations between maternal supportive behaviors, children's SRL skills, and cognitive performance

Tables 4 and 5 present the Pearson's *r* correlation coefficients between the eight maternal supportive behaviors, the children's strategic behaviors, and performance in the cognitive tasks in both domains. Only the significant correlations according to Bonferroni correction are presented.

   In both visual-spatial and language tasks, maternal boosting of the child's autonomy was significantly associated with children's actual use of cognitive strategies and with children's planning and monitoring skills during problem solving. Regarding only the visual-spatial tasks, maternal boost of autonomy was significantly and positively associated with all the children's SRL skills and with children's cognitive performance. In addition, in the visual-spatial tasks, maternal overcontrolling was

Table 4. Pearson's r correlation coefficients between maternal behaviors, children's strategic behaviors and performance in the visual-spatial tasks

Maternal behaviors	Children's performance	Children's SRL skills					
		Cognitive strategies	Planning	Monitoring	Concentration	Persistence	Working autonomously
Cognitive Support							
Planning							
Use of strategies							
Monitoring							
Positive affective and motivational context							
Criticism - Rejection							
Boosting autonomy	.50**	.57**	.57**	.58**	.55**	.49**	.45**
Overcontrolling		-.50**	-.59**	-.54**			

Note: Correlations are significant at the .006 level (Bonferonni correction)

Table 5. Pearson's r correlation coefficients between maternal behaviors, children's strategic behaviors and performance in the language tasks

Maternal behaviors	Children's performance	Children's SRL skills					
		Cognitive strategies	Planning	Monitoring	Concentration	Persistence	Working autonomously
Cognitive Support							
Planning							
Use of strategies							
Monitoring							
Positive affective and motivational context							
Criticism - Rejection							
Boosting autonomy		.50**	.45**	.49**			
Overcontrolling							

Note: Correlations are significant at .006 level (Bonferonni correction)

significantly and negatively correlated with children's use of cognitive strategies, planning, and monitoring skills.

Mothers' educational level and maternal behaviors supporting children's learning

To examine whether mother's educational level was associated with their learning supportive behaviors, a series of 3 (educational level) X 3 (maternal supportive

behaviors) MANOVAs were conducted with dependent variables the three groups of maternal behaviors described above, namely, Cognitive Support, Emotional-Motivational Support and Autonomy Support. For the visual-spatial tasks the multivariate tests showed that there was no statistically significant differences in maternal supportive behaviors as a function of maternal educational level: Pillai's trace $= .156$, $F(6, 62) = .872$, $p = .521$, partial $\eta^2 = .078$. Similarly, for the language tasks the multivariate tests showed that there was no statistically significant differences in maternal supportive behaviors as a function of maternal educational level: Pillai's trace $= .094$, $F(6, 62) = .508$, $p = .800$, partial $\eta^2 = .047$.

Although mothers from high educational background were more supportive than the other two groups of mothers in general, the differences in supportive behaviors were not statistically significant. For mothers with high educational background the mean scores in the visual-spatial tasks were: Cognitive Support $M = 2.79$, $SD = .42$; Emotional-Motivational Support $M = 3.06$, $SD = .52$; Autonomy Support $M = 2.70$, $SD = .48$. For mothers with high educational background the mean scores in the language tasks were: Cognitive Support $M = 2.20$, $SD = .65$; Emotional-Motivational Support $M = 2.80$, $SD = .53$; Autonomy Support $M = 2.90$, $SD = .64$.

DISCUSSION

The aim of the present study was to adapt the Neitzel and Stright's (2003) coding system for assessing maternal scaffolding during children's problem solving and to investigate the relations of various aspects of maternal support of learning with children's actual SRL skills and cognitive performance. Different maternal behaviors enacted to support the children during cognitive problem solving were assessed via a revised version of the Neitzel and Stright's (2003) coding system. Specifically, maternal Cognitive and Metacognitive Support to the children, Emotional-Motivational Support, and children's Autonomy Support were examined. Very few studies so far have examined in depth different aspects of parental behaviors that support children's learning and to what extent these different aspects are related to children's specific self-regulatory skills and respective performance.

The revised maternal observation system was found to be a reliable and useful instrument for assessing different aspects of actual maternal behaviors to support children's learning and problem solving. The inter-rater reliability indices were high. Regarding the correlations between the maternal behaviors, as expected, Cognitive and Metacognitive supportive behaviors were strongly correlated in both cognitive domains. Moreover, Hypothesis 1a stated that Cognitive and Metacognitive Support

behaviors would have moderate correlations with Emotional-Motivational Support behaviors and with Autonomy Support behaviors. In general, the significant associations between the Cognitive and Metacognitive support and the other two aspects of maternal support were not many. However, the significant correlations found were indeed of a moderate level supporting, thus, the respective hypothesis and suggesting that the different types of maternal behaviors represent distinct aspects of learning support.

It was further hypothesized that maternal Cognitive and Metacognitive Support behaviors would be positively related to Positive affective-motivational context and negatively to maternal Criticism-rejection (Hypothesis 1b). The first part of this hypothesis was confirmed but not the second, as maternal support of children's Cognition was not significantly associated with maternal Criticism-rejection. The above findings in general agree with those reported by Neitzel and Stright (2003) who found that the correlations between the four different parental dimensions assessed in their study ranged from low to moderate (rs = .20 to .57 for the dimensions of Metacognitive Information, Manner of Instruction, Emotional Support and Transfer of Responsibility). In a subsequent study (Neitzel & Stright, 2004), they also reported that the correlation between the six parental behaviors assessed ranged from low to moderate (rs = -.57 to .68 for the dimensions of Regulating Task Difficulty, Metacognitive Information, Encouragement, Rejection of Child, Overcontrol, Encouraging Child's Active Role).

The significant differences found between the scores of the different types of maternal behaviors might be an additional indication of their conceptual distinction. The maternal Cognitive and Metacognitive Support score was significantly different from the Emotional-Motivational Support score in both cognitive domains and different from the Autonomy Support score in the language domain. Moreover, it was observed that in the language domain the differences between the scores of the various aspects of maternal behaviors were more profound in comparison to the visual-spatial domain. This finding might be an indication of a possible domain effect on maternal support of learning. Further investigation focusing on the role of the nature of the learning tasks on parental support of learning is warranted.

Hypothesis 2 stated that the various forms of maternal behaviors assessed would be differentially associated with children's SRL skills and achievement. Specifically, it was expected that positive maternal behaviors would be positively associated with children's SRL skills and achievement (Hypothesis 2a) while negative maternal behaviors, namely, Criticism-rejection and Overcontrolling, would be negatively associated with children's SRL skills and achievement (Hypothesis 2b). A general finding related to the above hypotheses was that a few significant associations were

revealed between maternal supportive behaviors, children's use of SRL skills and children's performance. The exception was the maternal Boost of children's autonomy that was significantly and positively correlated in both cognitive domains with children's actual use of Cognitive strategies and with children's Planning skills, and Monitoring skills during problem solving. The positive associations between children's cognition and achievements with maternal Boost of their autonomy is a finding that is in line with previous studies claiming that children's autonomy support is associated with children's higher performance, executive function and social and academic skills (Bernier et al., 2010; Grolnick et al., 2002; Joussemet et al., 2005).

Moreover, different associations were revealed in the two cognitive domains. Only in the visual-spatial tasks, maternal Boost of autonomy was significantly and positively associated with all the children's SRL skills and with children's cognitive performance. In addition, only in the visual-spatial tasks, maternal Overcontrolling was significantly and negatively correlated with children's use of Cognitive strategies, Planning, and Monitoring skills. It seems that in future studies it is worth exploring how the nature of the cognitive tasks is related to the associations between parental support of learning and children's learning skills.

Overall, the majority of the maternal behaviors examined were not significantly related to children's SRL skills and cognitive performance in both cognitive domains. This general finding agrees with a recent study that reported that only parental contingency, and not the distinct aspects of parental scaffolding that were measured, was the significant predictor of young children's SRL skills (Zhang & Whitebread, 2017). The young age of the participant children could be related to these results. At these young ages, there are dynamic and still developing interactions between parents and children during the children's early cognitive endeavors. Environmental influences on children's skills have not been established yet at these early ages. The frequency and quality of these interactions related to learning situations over time are expected to longitudinally influence children's cognitive style, motivation, educational choices, and achievements (Bronson, 2000; Dieterich, Assel, Swank, Smith, & Landry, 2006; Kochanska, Coy, & Murray, 2001; Landry, Smith, Swank, & Miller-Loncar, 2000; Pino-Pasternak & Whitebread, 2010). The present findings on the early interactions between mothers and children during the children's cognitive endeavors denote that, during the preschool ages, a developing and dynamic network of relations emerges between maternal scaffolding behaviors and children's cognitive performance and learning skills. Probably, it is still early to expect close and one- to-one associations between maternal supportive behaviors and children's skills. In the future, longitudinal research designs should shed further light on these associations.

Based on previous literature, it was also assumed that maternal supportive

behaviors would be differentiated as a function of mothers' educational level (Hypothesis 3). This hypothesis was not confirmed with reference to the participant mother-child pairs of this study. The limited number of the participant mothers of this study and their high educational background could explain why the supportive behaviors of this group of mothers were not significantly differentiated as a function of their educational background. Moreover, some studies reported that the relationship of maternal education with scaffolding behaviors was mediated by other environmental factors (Carr & Pike, 2012). In the future, possible mediating environmental influences on this relationship should be investigated.

Limitations of the study

A shortcoming of the present study is the limited number of mother-child pairs participating in the study. Although this was dictated by the complex individual assessment of each participant, future studies should replicate these findings with larger numbers of participants. Moreover, larger numbers of participants will allow testing the maternal observation tool's structural validity and other psychometric properties of it.

Moreover, as mothers were hesitant to the use of a video recording, it was decided to employ a voice recorder instead. Therefore, this may have led to missing important non-verbal information, which was captured mainly by the researcher's observation during the interaction. However, social cues such as the tone of the mothers' voice were available for assessment from the voice recordings.

A further limitation of this study was that the assessment of each pair was done once and it took place during one specific time point. Longitudinal research designs are needed in order to investigate the developing parent-young children interactions. In addition, more evidence is needed and other mediating variables (e.g., family income, family general conditions, parental beliefs about children's education, etc.) need to be examined to further investigate the effects of the level of educational background on parental behaviors to support children's learning. Finally, future research should shed further light to the inter-domain differences and provide appropriate explanations on these differences.

Conclusions and implications for theory, research and practice

Very few studies so far have provided data on the relations between distinct parental behaviors and children's specific self-regulatory skills and performance during actual cognitive endeavors. Investigating such relationships could contribute to our knowledge on children's developing self-regulation skills at early ages and on the role

parents can play in this development and in their children's accomplishments. The present study shows that early in young children's learning experiences, maternal behaviors activated to support children's cognitive endeavors, especially those that boost autonomy, start being directly associated with children's SRL skills and cognitive performance. There is clearly a need to further investigate the frequency and quality of interactions during repeated learning episodes between children and adults (e.g., parents, teachers) who are responsible for children's learning. Valid and reliable tools that allow researchers and educators to capture the actual adult practices at a micro-level are needed. Structured observation tools could be useful in recording and investigating such behaviors enacted during joint learning and their relationships with other parental, child, and contextual factors. Finally, shedding more light on the above relations and studying the differences in parental scaffolding depending on the cognitive domain of achievement might enable educators and psychologists to design and implement more focused and effective educational programs addressed to adults who are involved in children's learning.

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APPENDIX A

Examples of the scoring criteria for assessing children's performance in the language tasks

Logical thinking and coherence of meanings
Point 1:
There is a lack of coherence in the story. The child merely describes the cards, without any attempt to meaningfully connect the cards to each other. The child makes a few or no references to the main information of the cards.
Point 4:
The child produces a story with a clear and logical conceptual continuity, there are no meaningless blanks in the story or ambiguities (this means that the child is aware of the logical rules that link the cards together and places the cards in the correct, reasonable order).

Vocabulary
Point 1:
The vocabulary of the child is generally poor for his/her age, the child uses the same phrases and words or a very small range of words, the child has difficulties in expressing himself/herself and his/her narrative is restricted to a specific central point of history, a single card or hero.
Point 4:
The child has significant verbal fluency. He/she describes the cards in detail and lists all their important and secondary elements using a rich vocabulary. The child reports ample information on the characters of the cards, the scenes, their intentions, the initial and final events, their reactions, etc.

Structure of the story
Point 1:
The child fails to capture the important events of the story and is referred randomly to the images he/she sees. There is no structure in the story or distinct end or conceptual "closure".
Point 4:
The child's story has a clear identifiable structure (beginning-middle-end), it includes the description of all the pictures of the story and in the order they were presented. The story has a reasonable end and a meaningful "closure".

APPENDIX B

Examples of the scoring criteria for assessing children's strategic behaviors

Cognitive strategic behaviors
1. No evaluation of the card-model during the construction and considering all the information as equally important.
2. Using the card-model randomly and confusing the important information with the non-important.
3. Using the card-model occasionally and often discovering the important information for the construction.
4. Using efficiently and effectively the card-model and choosing systematically to deal. with the important information of the construction.

Metacognitive strategic behaviors
Planning
1. Approaching the task as trial and error (waste of time).
2. Working with a plan only occasionally (usually wasting time).
3. Building in gradual steps, however a clear plan is not always apparent
4. Working with a clear plan; using time effectively.

Motivational/volitional strategic behaviors
Persistence
1. Pausing in front of a difficulty and stopping without completing the activity.
2. Stopping when confronted with difficulties and being easily frustrated but returning.
   to the solution process when prompted to do so.
3. Persisting in face of difficulties, stopping when bored.
4. Working with persistence despite the difficulties encountered until coming up with a solution.

Autonomy behaviors
1. Asks continuously for help or reinforcement/reward.
2. Often asks for help or reinforcement (verbal or nonverbal), feels uncertain.
3. Occasionally needs reinforcement by the experimenter.
4. Works autonomously, needs no intervention or reinforcement by the experimenter

APPENDIX C

Examples of the scoring criteria for assessing maternal supportive behaviors

Cognitive support
1. The mother does not provide hints, clues, or prompts to help the child understand the task, its nature, characteristics, material, and the learning goal.
2. The mother provides some hints, clues, or prompts to help the child understand the task, its nature, characteristics, material, and the learning goal.
3. The mother provides a fair amount of hints, clues, prompts in order to help the child understand the task, its characteristics, material, processes, and the learning goal.
4. The mother provides adequate and appropriate hints, clues, and prompts in order to help the child to deeply understand the task, its characteristics, material, processes, and the learning goal.

Metacognitive support: Monitoring progress and evaluation of the cognitive outcome
1. The mother does not provide support to the child to monitor the progress made so far or discover possible mistakes or evaluate the cognitive outcomes.
2. The mother makes few non-systematic comments to support the child to monitor the progress made so far or discover possible mistakes or evaluate the cognitive outcomes.
3. The mother often provides comments or clues to support the child to monitor the progress made so far, to discover possible mistakes and to evaluate the cognitive outcomes.
4. The mother makes constant and meaningful comments to support the child to monitor the progress made so far in relation to the final goal, to discover possible mistakes and to evaluate the cognitive outcomes.

Emotional and motivational support: Positive affective and motivational context
1. The mother is either emotionally neutral or not supportive or never tries to motivate the child.
2. The mother provides occasional emotional support and motivation to the child.
3. The mother often provides emotional support, encouragement, and motivation to the child.
4. Mother's emotional and motivational support to the child is constant and systematic.

Emotional and motivational support: Criticism-rejection

1. The mother is never verbally or non-verbally judgmental to the child.
2. The mother demonstrates very few negative responses or criticism towards the child.
3. The mother often but not consistently demonstrates negative responses or criticism.
4. The mother systematically and consistently responds negatively to the child and makes negative comments.

Children's autonomy: Boosting autonomy and active involvement

1. The mother does not provide any prompts, hints, or clues to support the child's autonomous activity and personal progress. She doesn't actively involve the child.
2. The mother provides few and occasional prompts, hints, or clues to support the child's autonomy, active involvement, and personal progress.
3. The mother often but not consistently boosts the child's autonomous action and active involvement.
4. The mother systematically and consistently boosts the child's autonomy and active involvement through questions, prompts, hints and clues.