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Exploring Regulatory Interactions Among Young Children and Their Teachers: A Focus on Teachers' Monitoring Activities

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ABSTRACT: This study explored the differences in teachers' monitoring of children during socio-emotional challenges children face in day care. Furthermore, the study investigated the association between teachers' monitoring activities and children's strategy use targeted at regulating emotions and behavior in these challenging situations. The data consist of 44 video-recorded events of challenging situations. First, quantitative associations were explored between teachers' monitoring and children's use of different strategies, as well as children's possible adaptation of strategy use. Furthermore, these interactions were explored qualitatively, describing the ways teachers' active monitoring manifested and contributed to the children's strategy use. The results show that teachers' active monitoring was associated with children's adaptation of strategy use during the challenge. Qualitative exploration further illustrated how teachers' active monitoring in challenging situations enabled the teachers to adjust their support for children and further, help children adapt strategy use. In contrast, weak monitoring resulted in less adequate support, leading to children repeating ineffective strategies or turning back to less constructive ways of resolving the challenges instead of adapting their behavior according to the situational demands. The findings highlight the importance of teachers' constant monitoring of children's behavior, so that the teachers can identify the need for support when children experience challenging situations, as they are the situations in which children can learn to manage challenges and adapt their regulatory behavior according to the demands of the situation.

Keywords: *emotion and behavior regulation, teacher support, monitoring, video observation*

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Introduction

The ways teachers monitor and interpret children's need for either academic or social support in classroom activities has been acknowledged as an important part of high-quality classroom interactions (La Paro, Pianta, & Stuhlman, 2004). In turn, high-quality classroom interactions, particularly emotional support, have been connected to children's emotion- and behavior-regulation skills (Hamre & Pianta, 2005; Rimm-Kaufman et al., 2009), as well as children's motivation for academic activities (Mantzicopoulos, Patrick, Strati & Watson, 2017). Various studies support the notion that children's ability to regulate their emotions and behavior in adaptive and appropriate ways affects several areas of the children's lives—for example, in learning outcomes (Kim & Hodges, 2012; Schmitt, McClelland, Tominey & Acock 2015; Valiente, Lemery-Chalfant, & Swanson, 2010), social relations (Blair & Raver, 2015; Denham et al., 2003), and aspects of general well-being (John & Gross, 2004; McLaughlin, 2008; McRae et al., 2012)—and that these effects last until adulthood (Blair & Diamond, 2008). Thus, focusing on interactions in which children develop and practice emotion- and behavior-regulation skills is an essential area of research. Understanding these processes more profoundly can help develop early childhood education practices where support from teachers for children's emotion and behavior regulation is appropriately timed and focused so that the practices optimally support children in learning these skills.

Previous research supports the notion that although children have inherently different starting points for developing general self-regulation skills, including emotional, behavioral, and cognitive self-regulation (Eisenberg, Spinrad, & Eggum, 2010; Fox & Calkins, 2003; McClelland, John Geldhof, Cameron, & Wanless, 2015), these skills are also strongly affected by interactions children engage in, particularly in the early years of their lives (Colman, Hardy, Albert, Raffaelli, & Crockett, 2006; Gallimore & Tharp, 1990; Perry & Rahim, 2011). Thus far, research on young children's self-regulation has mainly focused on general regulation abilities and has used indirect measures of these skills, such as parent or teacher reports, as well as structured tasks in controlled environments (Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003; Penela, Walker, Degnan, Fox, & Henderson, 2015). In addition, classroom activities have been studied using ready-made criteria, focusing on the general features of the interactions, such as classroom organization and emotional and instructional support (Pianta, La Paro, & Hamre, 2008). However, there have been few in-depth explorations of the different aspects of the interactions and their relation to children's emotion and behavior regulation during authentic day care situations (Kurki, Järvenoja, Järvelä, & Mykkänen, 2017; Silkenbeumer, Schiller, & Kärtner, 2018). These types of approaches may be

beneficial for exploring the processes in which direct connections of teachers' activities to children's behavior can be detected. These are the aspects of the interactions that ready-made questionnaires and observational measures exploring the overall associations of general variables are not able to capture. Thus, there is a need for research that focuses on different features of authentic everyday interactions children engage in with their caretakers, where learning and development of regulation skills are located.

In this research, teachers' activities are explored in terms of how the teachers monitor children's behavior in socio-emotionally challenging situations. These are the situations in which emotions arise and challenge children's activities. The challenges may derive from, for example, when two children playing together have opposite or variant interpretations of the situation. A socio-emotional challenge can also emerge if a child's goal for the situation differs from that of other children or teachers (Arsenio & Lover, 1997; Järvenoja, Volet, & Järvelä, 2012). It is assumed that to support children's emotion and behavior regulation, teachers should continuously monitor children's activities: not only to identify the challenge but also to continue monitoring how the challenge is resolved (La Paro et al., 2004). Thus, in this study, teachers' monitoring activities refer to the way teachers observe how children manage their emotional and behavioral reactions, as well as solve the challenge in the socio-emotionally challenging situations the children face and identify their need for a timed and appropriate level of external support (Blair & Diamond, 2008; Bodrova & Leong, 2007; Hamre & Pianta, 2007; van de Pol, Volman, & Beishuizen, 2010). Focusing on this aspect of teacher support is important, as these are the interactions in which children are assumed to acquire and rehearse emotion and behavior regulation skills (Boekaerts & Pekrun, 2015; Denham & Kochanoff, 2002).

Young children's emotion and behavior regulation

Self-regulation has been regarded as a broad, multidimensional concept describing abilities related to cognitive, emotional, and behavioral control processes (Baumeister & Vohs, 2004; Bronson, 2000; Cole, Martin, & Dennis, 2004; Kochanska, Murray, & Harlan, 2000; Robson, 2010; Rueda, Posner, & Rothbart, 2005). Self-regulation inherently includes the idea of adaptation and behavioral change (Hadwin, 2013). Self-regulation has been defined as the process of analyzing one's choices and the consequences of one's actions and adapting one's behavior to reach a particular goal (McClelland et al., 2015; Morris, Silk, Steinberg, Myers, & Robinson, 2007; Whitebread & Basilio, 2012). Thus, self-regulation encompasses internal metacognitive and motivational processes, as well

as strategic actions (Perry & Winne, 2006; Schunk & Zimmerman, 2007). The regulation of emotions and behavior is regarded as one aspect of self-regulation (Neuenschwander, Röthlisberger, Cimeli, & Roebers, 2011; Robson, 2010). In the literature, emotion regulation has been defined as deliberate efforts to adaptively modify, change, or inhibit emotional reactions and behavior related to these reactions in accordance with expectations or one's own goals (McClelland et al., 2007; Morris et al., 2007; Whitebread & Basilio, 2012). These definitions focus on the aspect of control in emotion regulation, but learning theorists emphasize the monitoring and evaluation of emotional experiences and reactions as a part of the processes of emotion regulation (Pekrun, Muis, & Frenzel, 2017; Wolters, 2003).

In educational settings, challenges in social and learning situations can evoke emotions that must be regulated to continue learning or related academic activities accordingly (Bronson, 2000; McClelland & Cameron, 2011). In these socio-emotionally challenging situations, children's emotion and behavior regulation skills manifest as the children's ability to monitor their own emotions and behavior and to employ strategies to modify, adapt, or inhibit behavior and emotional reactions according to the expectations and goals of the situation (Morris et al., 2007; Whitebread & Basilio, 2012). Instead of persisting in an incorrect or inefficient response or choosing to neglect a goal, a child with self-regulation abilities is able to adapt his or her actions if the initial strategy seems ineffective (Bryce, Whitebread & Szũcs, 2015; McClelland et al., 2007). In the present study, these abilities are seen as children's ability to adapt strategy use: to change or modify their strategies during socio-emotional challenges.

Several classifications have been made when describing different emotion regulation strategies. Research indicates that in emotionally challenging situations young children in particular seem to favor strategies that focus on regulating others in the situation or the situation itself, rather than focusing on the children's own emotional states (McCoy & Masters, 1985; Pons, Harris & Rosnay, 2004). This focus on the external characteristics of the situation can be considered an indication of a lack of ability to regulate internal emotional states (Bronson, 2000; Davis, Levine, Lench, & Quas, 2011; Pons et al., 2004). Gross's five families of emotion regulation strategies acknowledge this difference between different types of strategies. Gross and Thompson (2007, 2014) posit that different strategy families affect different points in the emotion-generative process. Antecedent-focused strategies are assumed to occur early in the emotion-generative process before the emotional response has fully occurred. They consist of strategies in which an individual selects a situation to manage his or her own anticipated emotional reactions (situation selection) or strategies aimed at modifying the situation to change its emotional impact (situation modification). They also consist of strategies of reappraising or altering the emotional significance of the situation

(cognitive change) and shifting attention to manage the individual's own emotional reactions. Response-focused strategies (response modulation), in contrast, are aimed at modulating or controlling already occurring emotions, either inhibiting or expressing the individual's own emotional expressions or reactions (Gross & Thompson, 2007).

In particular, situation modification, response modulation, and attentional strategies have been regarded as effective and accessible emotion regulation strategies for younger children (McClelland et al., 2015; Stansbury & Zimmermann, 1999). Response modulation, such as expressing emotions, can act as a powerful way to regulate others in a given situation (Rimé, 2007; Yan, 2012). Attentional strategies, in turn, are the first strategies children can use, which, when the strategies become more sophisticated and intentional, have an impact on learning processes (Whitebread & Basilio, 2012). It is assumed that certain strategies require a level of cognitive ability, and thus, cognitive strategies (cognitive change and reappraisal) for regulating emotions are less commonly used among young children (Davis et al., 2011; Stansbury & Zimmermann, 1999).

Teacher support in children's regulation of emotions and behavior

In educational settings, teachers play a key role in providing a context and support for children in learning how to regulate their emotions and behavior. A strong body of research indicates that positive, sensitive, and responsive interactions are positively associated with children's regulation abilities (Colman et al., 2006; Kopystynska, Spinrad, Seay, & Eisenberg, 2016; Lengua et al., 2013; McCoy & Raver, 2011; Rimm-Kaufman et al., 2002). However, the concepts used to describe and operationalize the phenomenon of teacher–child interactions have varied in the literature. The quality of teacher–child interactions has been studied, for example, by measuring overall classroom management, including measures of emotional and instructional support, behavior management, and classroom organization (La Paro et al., 2004; Mantzicopoulos et al., 2017). Teachers' interactions with children have also been explored in more detail by describing the co-regulation strategies teachers use in authentic day care situations, referring to the ways teachers modify children's thoughts, behavior, or emotions to support and scaffold children's participation in day care activities (Colman et al., 2006; Kurki, Järvenoja, Järvelä, & Mykkänen, 2016; Volet, Summers, & Thurman, 2009). Earlier research has shown that teachers co-regulate children by supporting them in choosing and using emotion and behavior regulation strategies and in understanding emotions and the situation evoking the children's emotions (Kurki, Järvenoja, Järvelä & Mykkänen, 2016). In addition to the quality of

support given, the level of support teachers provide is important to acknowledge when exploring these activities (Hamre & Pianta, 2007; Silkenbeumer et al., 2018; van de Pol et al., 2010). Too little or no support may increase children's use of less adaptive regulation strategies and less sophisticated resolutions in socio-emotional challenges, as well as prevent children from modeling and rehearsing the use of more appropriate regulation strategies (Kurki et al., 2017; La Paro et al., 2004).

To provide an appropriate level of support for children to conduct and rehearse sophisticated emotion- and behavior-regulation strategies, it is important for teachers to monitor children's behavior. Monitoring means actively observing and interpreting children's activities and children's need for external support in regulating emotions and behavior, as well as in managing the challenge (Blair & Diamond, 2008; Bodrova & Leong, 2007; Hamre & Pianta, 2007; van de Pol et al., 2010). Hamre and Pianta (2007) point out that emotionally supportive teachers in particular monitor and notice when students need either academic or social support and respond accordingly. La Paro and colleagues (2004) stress the importance of monitoring children's engagement in learning activities to direct and prevent disruptive and off-task behavior and ensure productive learning activities. Overall, monitoring activities have been regarded as part of flexible classroom management, where teachers monitor, prevent, and redirect children's behavior in a way that considers children's interests and fosters children's autonomous behavior (Hamre & Pianta, 2007; La Paro et al., 2004).

In sum, previous research shows that the quality of teacher–child interaction makes a difference in aspects of children's self-regulation skills (Eisenberg et al., 2010; McCoy & Raver, 2011; von Suchodoletz, Trommsdorff, & Heikamp, 2011). However, what has not yet been fully explored are different aspects of teachers' activities that contribute to children's strategy use there and then, where the learning and rehearsal of employing strategies are located. More research is needed to understand more profoundly the links between teachers' supportive activities, including monitoring children's behavior, and children's use of emotion- and behavior-regulation strategies in authentic challenging situations. By understanding these connections, it is possible to provide children optimal interactions for developing regulation skills (Colman et al., 2006; Volet et al., 2009).

Aims

The aim of this study is to explore the ways in which teachers monitor children's behavior in socio-emotionally challenging situations and how these monitoring activities relate to children's emotion and behavior regulation strategy use in the day care context. The research questions are as follows: 1) How is teachers' monitoring

related to children's use of emotion- and behavior-regulation strategies? 2) How do teachers' monitoring activities manifest and contribute to children's emotion and behavior regulation strategy use in the actual situation?

Method

Participants and data collection

The participants of this study were two teachers and six teacher trainees and 30 Finnish children (ages 2.0 to 4.6 years, mean age 3.25, 14 boys and 16 girls) who attended regular, open early education activities. These activities were located in facilities designed for teaching and research purposes. The open day care facilities consisted of one large L-shaped room divided into small areas and a kitchen. The facilities contained four fixed cameras and microphones that simultaneously record activities. Video recordings were used to observe children's and teachers' activities during open day care hours.

The videotaped day care activities were part of general open day care activities offered in Finnish early education for children who do not attend kindergarten. Half of the video recordings were collected in the autumn term and half in the spring term. The children were divided into two groups of 15, who regularly participated in the open day care activities twice a week, three hours per day. All 30 children participated in the study. The activities varied daily, but generally consisted of a teacher-directed program in the morning, free play, handicraft time, and snack time. One group was present at a time. In the morning, one or two teachers led the program, and during free play, teachers, for example, read books to some children or participated in the play in different ways. The teachers were present during all the activities in both groups, but the composition of the teachers varied. During the teacher training period, three teacher trainees led the activities, and at other times, two teachers provided the activities for the children. All eight teachers worked in both groups, but at different times: three during the autumn term and three during the spring term. Two teachers remained the same throughout the data collection. No differences were found between the teachers and teacher trainees in their supportive activities towards children. Therefore in this study, also teacher trainees are referred to as teachers.

The researcher recorded the open day care activities for 10 days, three hours per day. Three cameras were used simultaneously to record activities in different areas of the facilities. In all, 90 hours of video data were gathered. When recording, a researcher was present in the control room, steered the cameras when necessary, and made online

notes of the perceived challenging situations with time stamps. Instead of following one child at a time, the researcher made time stamps on every challenge that occurred during the day care activities. The participants were aware that their actions were being recorded, but the researcher was not visibly present during the day care activities. Thus, from the children's and teachers' perspectives, the context was similar to a regular open day care environment.

Ethical issues were considered in this study. Teachers and parents of the participants were provided with consent forms for recording the day care activities. In addition, the teachers, parents, and children were informed about the periods when activities were recorded. The participants' anonymity was taken into account, and the confidentiality of the collected data was ensured by appropriate storage of the recordings. The video recordings were viewed only by the researchers. Examples of the data were presented in transcript form and participants' names were replaced with pseudonyms.

Analysis

To explore the qualities of teachers' and children's activities in socio-emotionally challenging situations, as well as their associations, this analysis implemented quantitative and qualitative methods (Creswell, 2013; Johnson & Onwuegbuzie, 2004). The purpose for engaging in a mixed-methods approach was to first reach a general overview of the associations between teacher monitoring activities and their relations with children's strategic behavior. This would justify the selection of the qualitative case examples that provide an in-depth understanding of the qualitative differences between the qualitatively and statistically different types of situations.

The analysis was composed of five phases (see Figure 1). It proceeded from identifying socio-emotionally challenging events from the video corpus (Phase 1) to analyzing teachers' monitoring activity (Phase 2). In Phase 3, children's use of emotion- and behavior-regulation strategies in challenging situations were coded in terms of strategies and adaptation of strategy use. Phase 4 included statistically testing associations between teachers' monitoring activities and children's strategy use. Finally, in Phase 5, the teachers' different monitoring activities were described with qualitative illustrations. Two case examples were composed to demonstrate how monitoring is manifested in actual challenging situations and how it aligns to children's strategy use.

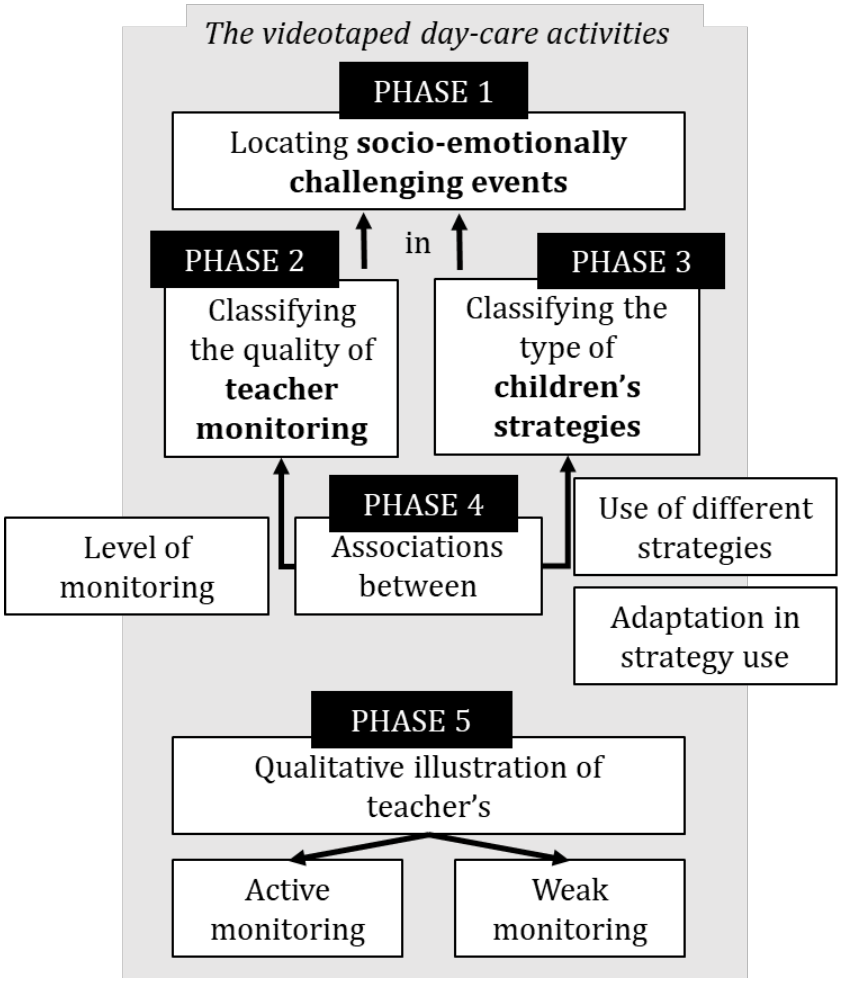


FIGURE 1 Analysis phases 1–5

Phase 1: Identifying socio-emotionally challenging events

The socio-emotionally challenging events were chosen by implementing selectively employed video analysis (Derry et al., 2010). The challenging events were defined as situations, where a researcher detected clear visible indications of emotional reactions or conflicting goals between participants (Arsenio & Lover, 1997; Järvenoja et al., 2012). The events consisted, for example, of peer or teacher–child conflict situations, situations in which children expressed separation anxiety or specific behavioral expectations for children were present (e.g., when children were expected to listen to a teacher-directed program). Other emotion-eliciting situations were found, such as when a child expressed fear of a scary-looking doll. Of the 75 identified challenges, the teacher was involved in 44. The durations of these events ranged from 0.5 to 6.0 minutes. One to three children were involved in each event. Each child participant was involved in approximately 4.2

events, the range from one to nine events per child. Mainly one teacher at a time was involved in the challenging situation. Thirty percent of the challenging events were coded for reliability by two independent researchers, and 100% agreement was reached in identifying events as socio-emotionally challenging.

Phase 2: Analysis of teachers' monitoring activities

Next, the analysis explored different ways the teachers monitored each child's behavior in the challenging events (Bodrova & Leong, 2007; van de Pol et al., 2010). Qualitative descriptions of teachers' activities in each event were made and two main categories were developed to describe teachers' monitoring: 1) Active monitoring included teachers' activities in which the teachers followed up regarding challenges until they were solved, teachers were present and actively supported children's strategy use and co-regulated their behaviors, or teachers first interfered with the children's challenges and continued monitoring the challenging situation from afar, making a new intervention if it appeared to be needed. 2) Weak monitoring included teacher activities in which the teacher interfered in the situation but either did not stay involved until the challenge was properly solved or did not actively monitor how the children managed the challenge. This included teachers' behaviors in which the teachers reacted to the challenge by providing support for the children's challenge but withdrew the support before the challenge was over and left the children on their own to solve the challenge.

The analysis was conducted at the event level but in relation to the child the teacher was monitoring. If the teacher monitored two children during the event, the monitoring was coded twice. Thus, it was also possible to see teachers conducting active monitoring of one child and weak monitoring of another child during one event. In addition, in some events, two teachers were involved. The monitoring activity was coded for the teacher expressing active monitoring of a child. Thirty percent of the challenging events were coded for reliability by two independent researchers in terms of the teachers' monitoring activities. A match was calculated if both researchers agreed that the teacher showed either active or weak monitoring during the event. Very good agreement was reached when the researchers coded the teachers' monitoring activity (active or weak monitoring) in the observations ($\kappa = .85$, $p < .001$).

Phase 3: Identifying children's emotion- and behavior-regulation strategies and adaptation in strategy use

Analysis of children's strategies

Next, the verbal and physical strategies the children used in the socio-emotionally challenging situations were coded based on categorizations of five emotion- and

behavior-regulation strategies: modifying the situation, providing information, selecting the situation, redirecting the activity, and modulating the response (Gross, 2014; Kurki et al., 2017). In this phase of the analysis, the unit of analysis was the occurrence of a strategy. This is, strategy use was coded every time a child expressed the use of any strategy that aimed to manage emotions or emotionally challenging situations. Thus, there could be several strategy codes for each child in one event. The frequency of the strategy use was calculated in each of the 44 events, in which also teacher was involved.

Situation modification included, for example, children's attempts to directly modify the situation or other people involved, such as pulling a toy from another child's hand or telling another child to leave. It also included attempts to change the situation by providing a solution or seeking help. The strategy providing information included statements children gave to inform the teacher about their own will or the challenging situation, such as when a child expressed that he or she wanted to play another game instead of the present one or when a child said she or he had the toy first. Situation selection was conducted when in a challenging event a child switched to off-task behavior or left the situation. Redirecting activity/attention included behaviors in which a child changed or modified his or her own activity or attention in the situation, for example, by switching back to the teacher-directed activities after being off-task. Finally, response modulation included behaviors for modulating emotional expressions, such as expressing anger or sadness, or behaviors in which a child clearly inhibited his or her behavior, such as when a child stopped yelling when asked.

An inter-rater reliability analysis was performed for 30% of the events using Cohen's kappa statistic. A match was calculated if both researchers agreed that a particular child was found to use a particular strategy during an event. Good agreement was reached when the researchers coded the regulation strategies in the observations ($\kappa = .708$, $p < .001$).

Analysis of children's adaptation of strategy use

Moreover, children's adaptation of strategy use during the events was analyzed by evaluating the temporal change in the children's strategy use during each event. As a unit of analysis, the children's adaptation of strategy use in the 44 events in which the teacher was involved was assessed. In this study, adaptation of strategy use refers to the overall strategic behavior of each child in the event, consisting of a series of strategies used during the event. Thus, children's adaptation of strategy use was analyzed at the event level. Because one to three children interacted during each challenging event, a total of 72 behavioral patterns of children could be analyzed from all 44 events. Behavioral patterns were defined as active changes in strategy use and no changes in

strategy use. This change was defined by comparing a child's initial strategies during the challenging situation against the ones used (or not used) at the end of the challenging situation (Kurki et al., 2017).

The "active adaptation of strategy use" included the observable behavior of a child who indicated active change or modification in strategy use when responding to other participants' behaviors or the challenge in the event (Hadwin, 2013). "No adaptation in strategy use" included the observable behavior of a child in which an active change in strategy use or adaptation could not be detected. These included children's observable behavioral patterns, indicating, for instance, a switch from an initial strategy to passive observation, disoriented behavior, resistance, or continuous behavior repetition (Bryce & Whitebread, 2012). An inter-rater reliability analysis was performed for 30% of the events using Cohen's kappa statistic. Very good agreement was reached when the researchers coded the children's change of strategy use in the observations ($\kappa = .835$, $p < .001$).

Phase 4: Analyzing the connections between teachers' monitoring or controlling activities and children's strategy use

In Phase 4, children's emotion- and behavior-regulation strategies were statistically tested in two ways. First, the occurrence of children's different strategies was explored in events with teachers' active monitoring and in events with teachers' weak monitoring. If there was more than one child in the challenging event, associations were explored based on whether the teacher showed active or weak monitoring of that particular child. Due to the low frequencies in the categories, Fisher's exact test was used to explore the associations between teachers' active and weak monitoring and children's strategies. Next, associations between children's adaptation of strategy use and the quality of the teacher's monitoring were explored using the chi-square test (Bakeman & Quera, 1995).

Phase 5: Qualitative illustrations of teachers' monitoring activities in relation to children's strategy use

In the final phase of the analysis, teachers' active and weak monitoring activities were explored in detail to illustrate how monitoring activities manifest in actual situations. Qualitative descriptions of teachers' different behaviors in the situations in which the teachers engaged in active monitoring, or alternatively, in weak monitoring, were created. The similarities and differences between teachers' monitoring activities in both categories (active and weak monitoring) and the teachers' relations to children's behavior were explored to provide examples of different ways teachers' monitoring activities occurred during interactions with children. To showcase these interactions in detail, two detailed case examples of two different types of situations were composed to

illustrate the interaction between the teacher and the children. The case examples demonstrate the differences between active and weak monitoring of the teacher and show how the teacher's monitoring contributed to the children's strategy use and the way the challenge was solved in practice. The case examples are composed of a detailed description of different ways teachers' active or weak monitoring manifested during the interaction, how the interaction in the challenging situation evolved along with the teachers' monitoring activities, and how children's strategies and adaptations of strategy use occurred during the situations.

Results

How is teachers' monitoring related to children's use of emotion- and behavior-regulation strategies?

Teachers' monitoring activities and qualities of children's strategies

The results show that teachers mainly conducted active monitoring (*f* = 51, 70.8 %) of children's behavior in socio-emotionally challenging situations, and there were fewer situations in which teachers provided weak monitoring (*f* = 21, 29.2 %). Overall, during teachers' monitoring activities in each event, children were coded using strategies 136 times. Table 1 presents the distribution of the frequency of five strategies the children used in two monitoring conditions (i.e., active and weak monitoring). Redirecting activity/attention was the most commonly used strategy during active monitoring (active: 36.9%, no or weak, 18.2%), whereas providing information was the most commonly used strategy in the condition of weak monitoring (no or weak: 33.3%, active: 27.2%). In turn, situation selection was least common in both conditions of teachers' monitoring (active: 11.7%, no or weak, 15.2%). However, no statistically significant associations were found in the distribution of particular strategies in the two teacher monitoring conditions explored with Fischer's exact test (*p* = .265).

TABLE 1 Children's strategies in the two teacher monitoring conditions

CHILDREN'S STRATEGIES	*ACTIVE MONITORING*		*WEAK MONITORING*	
	f	*%*	*f*	*%*
Providing information	28	27.2	11	33.3
Redirecting activity	38	36.9	6	18.2
Modulating the response	10	9.7	6	18.2
Modifying the situation	15	14.6	5	15.2
Selecting the situation	12	11.7	5	15.2
In all	103	100	33	100

Teachers' monitoring activities and their relation to children's adaptation of strategy use

Next, it was investigated whether teachers' level of monitoring in challenging situations was associated with children's adaptation of strategy use at the event level. Overall, children adapted their strategy use in 66.7% (f = 48) of the events and did not adapt their strategy use in 33.3% of the events (f = 24). A statistically significant difference was found between teachers' active monitoring and weak monitoring events in terms of the children's adaptation of strategy use ($\chi 2$ (1) = 7.563, w = 0.32, f = 72, $p < .05$). Children adapted their strategy use more when teachers' monitoring was active (f= 39, 81.2%) than when monitoring was weak (f=9, 18.8%). In turn, children expressed no adaptation of strategy use as often when the teachers' monitoring was weak (f = 12, 50%) as when it was active (f = 12, 50%).

How do teachers' monitoring activities manifest and contribute to children's emotion and behavior regulation strategy use in the actual situation?

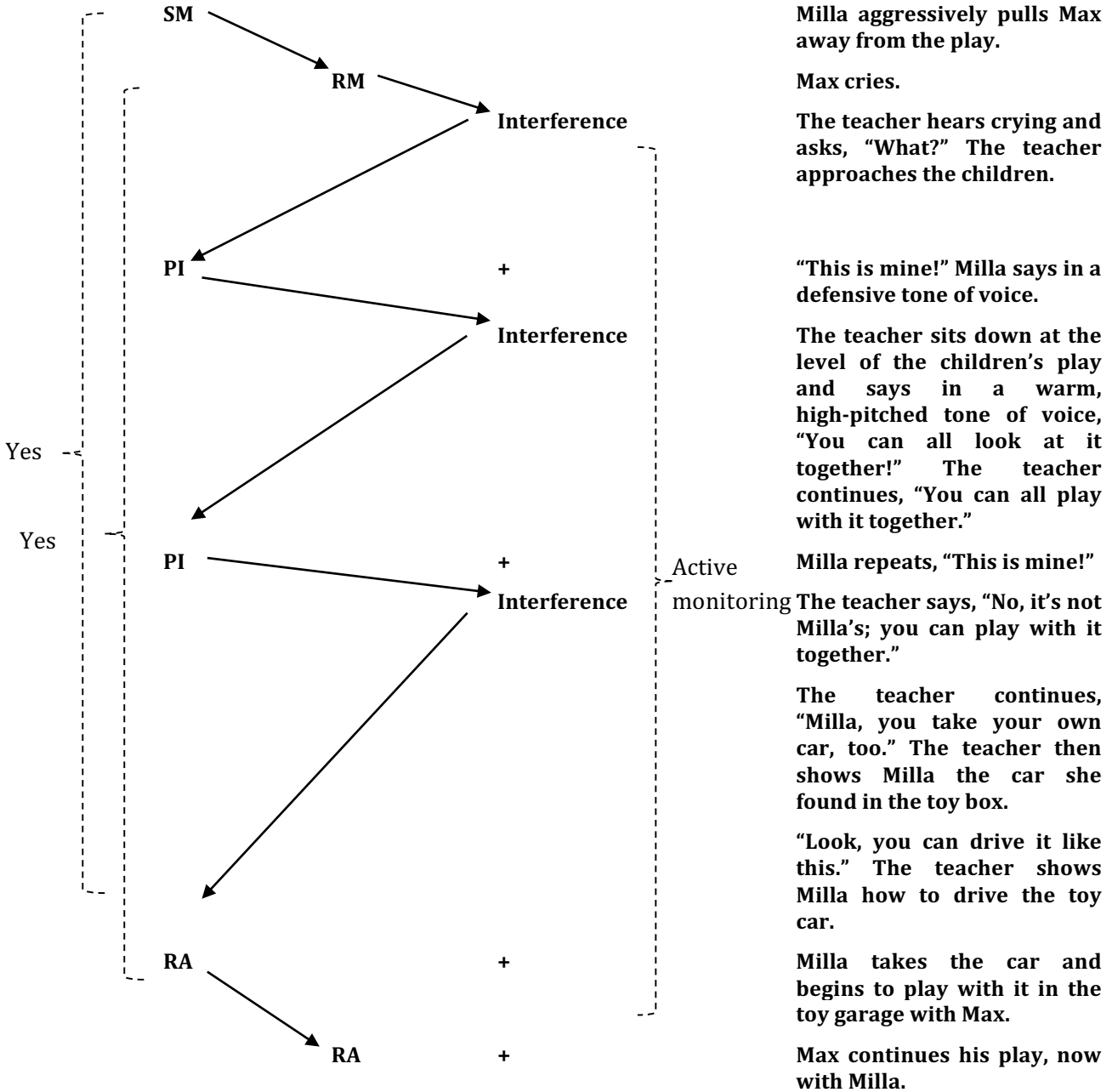
Next, we explored in depth how teachers' monitoring activities manifested in challenging situations. Based on the analysis of various situations in which teachers showed active or weak monitoring, these activities are described in more detail, and teachers' supportive actions in both situations with active or weak monitoring are described. In addition, to illustrate how teachers' different monitoring activities and children's strategy use and adaptation of strategy use occur during an interaction, case

examples of (see Table 2 and Table 3) active monitoring and weak monitoring are presented.

Active monitoring

Active monitoring (*f*=51) included various situations in which the teachers observed the challenging situation non-stop, showing constant awareness and interest in what was happening among the children and in how the challenge was solved. In these situations, teachers were often "physical," in that they physically held a child and verbally directed his or her attention toward activities, until the child showed signs of independent focusing. Likewise, in a situation in which a child was missing his or her parent, a teacher held the child and comforted him or her until the child showed signs of calming down and showed interest in participating in the activities. A teacher could also be constantly present in a peer conflict and actively provide solutions to a challenge until it was resolved. This included giving small cues and suggestions so the children could solve the challenge themselves or by taking over the regulatory role and providing strong physical and verbal guidance for solving the challenge. Active monitoring also included situations in which the teacher interfered in the situation and then observed the children's behavior from afar. If the teacher noticed that the conflict was not resolved appropriately, he or she could go back to the situation to repeat the instruction and use other supportive actions if needed. This also happened in a situation in which a child had problems focusing on a teacher-directed program. When a child showed signs of frustration and attempted to leave the situation, the teacher verbally or physically directed him or her back. The teacher then focused on the other activities but kept monitoring the child and repeated the action if he or she once again lost interest in the planning activity.

TABLE 2 Case 1: A conflict between Milla and Max



Note: SM: Situation modification; PI: Providing information; SS: Situation selection; RA: Redirecting activity/attention; RM: Response modulation; -: Weak monitoring; +: Active monitoring

Case 1 illustrates how the teacher actively monitors children's behavior and how children adapt their strategy use during active monitoring (see Table 2). The case demonstrates a prototypical event in which the teacher continuously monitors children's behaviors and responds to children's initiations accordingly. In 86 % of the events with active monitoring, this type of monitoring was detected. A peer conflict occurs when Milla (3.0 years old) wants to have the parking garage toy for herself and becomes aggressive toward Max (2.8 years old), who is playing with it using a small car. Max cries. This draws the teacher's attention to the children, and she interferes, using a warm and high-pitched tone of voice. The teacher leans over the children and provides an opportunity for Milla to articulate her will by saying, "It's mine!" (providing information), which then leads to the teacher correcting Milla's interpretation of who can play with the garage: "No, Milla, it's not yours." The teacher stays with the children and continues to help them solve the challenge by providing a solution: "You can all play with the garage together." She then continues by offering Milla her own car to play with and helps Milla direct her attention (redirecting activity/attention) to the play verbally and physically, showing how the car drives to the garage. The teacher stays involved until the challenging situation eases, monitors what is happening, and responds to the children's initiatives immediately. Thus, the teacher's behavior is regarded as active monitoring. The situation ends with Milla and Max continuing the play together, using their own cars. The children's strategy use changed from physical strategies and insisting to a redirecting activity in the direction the teacher pointed them in. Thus, in terms of adaptation, both children's behaviors were coded as changes in strategy use.

Weak monitoring

Behaviors in which the teachers ended their support in the challenging situations before the challenge was solved or did not monitor whether their instruction or other support made a difference in the children's behavior were coded into the category of weak monitoring. Weak monitoring in teachers' interference was detected less often (f = 21).

Weak monitoring included situations in which the teacher gave brief instructions to the children or insisted that they solve the challenge but then turned away to his or her own activities and did not continue to observe whether the children solved the challenge, often resulting in the children's continuous use of simple and physical strategies. However, if the conflict continued to escalate and the teacher noticed it, he or she could instruct the children to solve it again, without knowing what happened in between these two interferences. Situations with weak monitoring could also be those in which the teacher gave up on an attempt to, for example, refocus children's attention back to the program or a meal, when they showed frustration and boredom, again, resulting in the children losing track of the expected activities. In addition, another situation involved a

child doing something naughty and the teacher forbidding the child but continuing with his or her own activities to later notice that the child's behavior continued. In some events, the teacher interfered in the children's conflict and focused support on one child but did not actively monitor and support the other children in the conflict, even if the other child still expressed strong feelings or was not able to orient to normal activities.

Case 2 illustrates how a teacher shows weak monitoring of children's behavior and how children's strategy use manifests in solving the challenge (see Table 3). The case demonstrates a typical event of weak monitoring with the teacher interfering in the challenge mildly but not monitoring children's behavior further. This type of monitoring was detected in 50 % of the events with weak monitoring. The teacher is reading a book to another child, when a peer conflict between Joni (3.7 years old) and Pekka (4.5 years old) arises. Joni intentionally teases Pekka, takes his toys, and runs away, while Pekka is trying to get his toy back. Pekka's attempts to regulate the challenge include physically and verbally regulating the situation (modifying the situation). However, Joni is the one seeking help from the teacher in the situation. The teacher ends her reading activity with other children to ask Joni about who is teasing him and then briefly reviews the rules with Pekka, saying, "Teasing is not okay." Then, the teacher goes back to the activity with the other children and does not follow up on how the boys solve the challenge. The teacher's instructions seem to have an effect for a while: Pekka gives up at this point and picks up a new toy for his play (redirecting activity), but Joni looks disoriented and decides to continue teasing Pekka. This results in the same chasing behavior that occurred in the beginning: Pekka again begins to chase Joni.

In this event, although the teacher's interference affects Pekka's behavior for a while, the teacher does not continue to monitor how the children solve the challenge and thus, does not seem to know what is really happening. Pekka shows signs of altering his initial strategy, but he goes back to the old strategies when the situation continues. Joni also continues teasing Pekka. Therefore, both boys' behavior was coded as including no adaptation in strategy use.

TABLE 3 Case 2: A conflict between Pekka and Joni

ADAPTATION	*PEKKA'S STRATEGIES*	*JONI'S STRATEGIES*	*TEACHER'S MONITORING*	*BEHAVIOR/DIALOGUE*
				Joni has stolen Pekka's toy, and Pekka is chasing Joni to get it back.
	SM			**Pekka shouts, "Give it back!"**
	SM			**Pekka pulls the toy from Joni's hand.**
		SM		**Joni runs to the teacher and tells her, "Pekka is teasing me!"**
			Interference	**The teacher (reading books with other children) says, "Who is teasing you? Pekka?"**
No			**Interference**	**"It's not okay to tease." (The teacher moves back to reading books with other children.)**
No	**RA**		-	**Pekka takes another toy and continues the play.**
		SM	-	**Joni looks disoriented and then notices Pekka's new toy. Joni picks it up and begins to run again.**
	SM		-	**Pekka chases Joni again.**

Weak monitoring

Note: SM: Situation modification; PI: Providing information; SS: Situation selection; RA: Redirecting activity/attention; RM: Response modulation; -: Weak monitoring; +: Active monitoring

Discussion

This study provides further insight into the research field of young children's self-regulation by exploring the teacher's role in monitoring and supporting children in the use and rehearsal of emotion and behavior regulation strategies (Calkins & Hill, 2007; McClelland & Cameron, 2011; Morris et al., 2007). The study provides information on how children's strategy use and monitoring of these behaviors by teachers in socio-emotionally challenging situations emerge together, in terms of the occurrence of strategies and the adaptation of strategy use.

The results showed that there are differences in how teachers offer support in socio-emotionally challenging situations, particularly in how actively and continuously teachers monitor children's behavior and interfere during challenges. Monitoring children's behavior can be seen as an important part of classroom management aiming to ensure that the level and type of support given are in line with the challenge and the children's abilities to solve it (Pino-Pasternak, Whitebread, & Tolmie, 2010; Whitebread et al., 2007). However, the results indicate that possibly due to various reasons (e.g., insufficient time or not seeing the challenge as a learning experience for children), teachers monitor the challenges children face in different ways—or do not monitor them at all.

When studying the relationships between teachers' monitoring activities and children's emotion- and behavior-regulation strategies, it was found that teachers' monitoring was not connected to children's choice of strategies, per se. Instead, monitoring was connected to how children adapted their strategy use. Active monitoring was associated with the adaptation of strategy use among children. This finding is in line with previous findings in self-regulated learning research pointing out that if learners monitor a need to change cognition, behavior, motivation, or emotions, the learners are aware of various strategies they can use (Veenman, Van Hout-Wolters, & Afflerbach, 2006). The implication may be that teacher interference does not immediately change the strategies children use, but instead, teachers' continuous monitoring and supportive actions when needed may help children adapt their behavior to a more constructive end. The teachers' monitoring may have helped the children to become aware of their behavior and then be able to use their strategies to effectively control and regulate the behaviors (Wolters & Benzon, 2013).

This is particularly illustrated in the qualitative data examples in this study. The ways teachers monitored children in solving their challenges seemed to impact how the interaction in the challenging situation continued, how children changed their strategy use, and how the challenge was eventually solved. The results indicated that when teachers actively monitor children's behavior during socio-emotional challenges, the teachers are able to continuously adjust their support to match the children's needs to reach a sophisticated solution to the challenge as also La Paro and colleagues (2004) suggest. In turn, when teachers do not monitor actively, they are not able to interpret the situation accordingly and can fail to provide the support needed for children to regulate their emotions and behavior.

The results add to previous findings in research exploring classroom management, including teachers' tendency to monitor children's behavior (Hamre & Pianta, 2007; van de Pol et al., 2010). However, instead of showing general connections between teachers'

classroom management and children's self-regulation skills (Merritt, Wanless, Rimm-Kaufman, & Peugh, 2012), this study reveals how teachers' active monitoring immediately makes a difference in children's strategy use and shows how different monitoring approaches may contribute to children's behavior in different ways. Similar findings were found in a recent observational study by Silkenbeumer and colleagues (2018). In emotionally challenging situations, teachers adjusted their co-regulation to match a child's regulation skill level. The study also showed that teachers' co-regulation increased children's regulation activities during the challenge. The present study results contribute to the discussion on the appropriate level of support in children's various emotion- and behavior-regulation behaviors. Teachers' active monitoring can ensure that the support is adjusted to the level of the children's abilities to manage the challenge and provides an opportunity to rehearse regulatory activities (Pino-Pasternak et al., 2010). This study gives support to the notion that for children to learn and rehearse skills in emotion and behavior regulation and adapt their behavior during the course of interactions, it is not enough that teachers demonstrate or instruct on appropriate strategy use. Instead, they should also recognize the challenge and accurately interpret the support needed (Kurki et al., 2016; Silkenbeumer et al., 2018).

Although located in research facilities, this study was conducted in normal open day care settings, which made it possible to explore the regulatory interactions in their authentic form. However, this also led to several limitations of the study. For example, when researching authentic settings, comparisons between situations cannot be made as reliably as in a controlled setting. Moreover, the number of participants had to be kept limited to manage a substantial amount of video data for detailed analysis; therefore, individual differences between children based on, for example, their age or skill levels in self-regulation could not be reliably assessed and compared with video analysis. Taking all these limitations into account, the statistical results of this study should be considered with caution and as the basis for qualitative in-depth analysis rather than independent results.

Overall, socio-emotionally challenging situations are affected by several variables that were not taken into account in this study. Not only teachers' monitoring behaviors but also other factors are assumed to make a difference in children's strategy use. These behaviors are, for example, teachers' other supportive actions, including the quality of co-regulation the teachers provide (Kurki et al., 2016), peer interactions, factors affecting children's current state (sleep or previous interactions), as well as general child characteristics (the child's age and general emotion and behavior regulation skills). When video recordings are used, it is not possible to capture a participant's internal processes, such as intentions, goals, or certain regulation strategies, as the recordings capture only visible and audible behavior (Whitebread & Pino-Pasternak, 2014).

However, this is often a problem in other research methods studying young children due to their still-developing abilities to verbalize and reflect their internal processes (Bryce & Whitebread, 2012; Whitebread & Pino-Pasternak, 2014).

The results of this study emphasize the need to understand what aspects of teacher support play a role in children's emotion and behavior regulation in socio-emotionally challenging situations. It is assumed that teachers play a role not only in ensuring the learning and activity of a particular situation but also in supporting children in developing skills to regulate their emotions and behavior (Best & Miller, 2010; Von Suchodoletz et al., 2012). More research focusing on the interactional regulation processes is needed to explore more profoundly how teacher support contributes to children's (learning) activities in the moment and to children's development of regulation skills over time. In addition, further research is needed to understand the rationale behind teachers' choices of supportive actions.

In terms of the practical implications of this study, the results point out that teachers need to be aware of the support they provide and their immediate and long-term effects on children's regulation behaviors (McClelland & Cameron, 2011; Merritt et al., 2012; Whitebread & Basilio, 2012). Moreover, it is clear that teachers cannot be aware of the situational circumstances of every challenging situation emerging in everyday interactions, and this cannot be expected. However, this study argues that when teachers provide support for children, the teachers should be more aware of their role as co-regulators. Teachers should attempt to actively monitor and interpret the nature of the challenges children face and their own capabilities to solve the challenges appropriately, instead of jumping to a conclusion without having a proper understanding of the situation. In this way, teachers would be more prepared to employ timely and appropriate-level actions to help children to manage the challenges they face. In conclusion, there is a need for more research on interactions in early childhood settings to develop optimal educational practices for children to acquire skills in regulating their emotions and behavior in learning and social activities.

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