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**PRELIMINARY EFFICIENCY STUDIES OF AN EARLY EDUCATION PROGRAM  
FOR PREVENTING EARLY ONSET CONDUCT PROBLEMS IN PRESCHOOL  
CHILDREN**

**-PhD Thesis Abstract-**

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Către \_\_\_\_\_

Vă trimitem rezumatul tezei de doctorat PRELIMINARY EFFICIENCY STUDIES OF AN EARLY EDUCATION PROGRAM FOR PREVENTING EARLY ONSET CONDUCT PROBLEMS IN PRESCHOOL CHILDREN, autor Catrinel Alice Ștefan, teza urmând să fie susținută în vederea obținerii titlului științific de doctor în psihologie.

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**KEY WORDS:** early education, prevention, preschool children, early onset conduct problems

# **Chapter 1. A QUALITATIVE META-ANALYSIS OF EVIDENCE-BASED PREVENTION PROGRAMS TARGETING EARLY ONSET CONDUCT DISORDERS**

## **1. RATIONALE OF EARLY EDUCATION PROGRAMS**

A major amount of interest in research has been given to implementing high quality, empirically validated intervention programs for preschool children (Nation, Crusto, Wandersman, Kumpfer, Seybolt et al., 2003; Nelson, Westhues, & MacLeod, 2003; Webster-Stratton & Taylor, 2001). Literature on developmental psychology emphasizes that social and emotional competencies are protective factors against both mental health problems (Caldarella & Merrell, 1997; Engels, Finkenauer, Meeus, & Dekovic, 2001), as well as key elements for later school performance (Linares; Rosbruch, Stern, Edwards, Walker, et al., 2005; Trentacosta, Izard, Mostow, & Fine, 2006). Due to the fact that social and emotional competencies are relatively stable over time from preschool to adolescence (Abe & Izard, 1999; Eisenberg, Guthrie, Murphy, Shepard, Cumberland et al., 1999), maladaptive behaviors such as non-compliance, poor emotion regulation skills, or aggression that manifest during preschool tend to become preferred patterns of interaction putting children at risk mainly for conduct disorders (Cole, Teti, & Zahn-Waxler, 2003; Hastings, Zahn-Waxler, Robinson, Usher, & Bridges, 2000).

Increasing concern regarding early onset behavior disorders comes from a number of epidemiological studies, which indicate that incidence rates are somewhere between 5-25% for preschool children (Snyder, 2001). Moreover, children who develop a form of conduct disorder are more likely to be exposed to peer's rejection, delinquency, school drop-out, or substance abuse (Moffit & Caspi, 2001; Snyder, 2001). Thus there are compelling empirical evidence supporting the idea that early education programs targeting emotional and social development in children can be successfully used to prevent escalation of behaviors characteristic for externalizing disorders (Nation et al., 2003, Nelson et al., 2003).

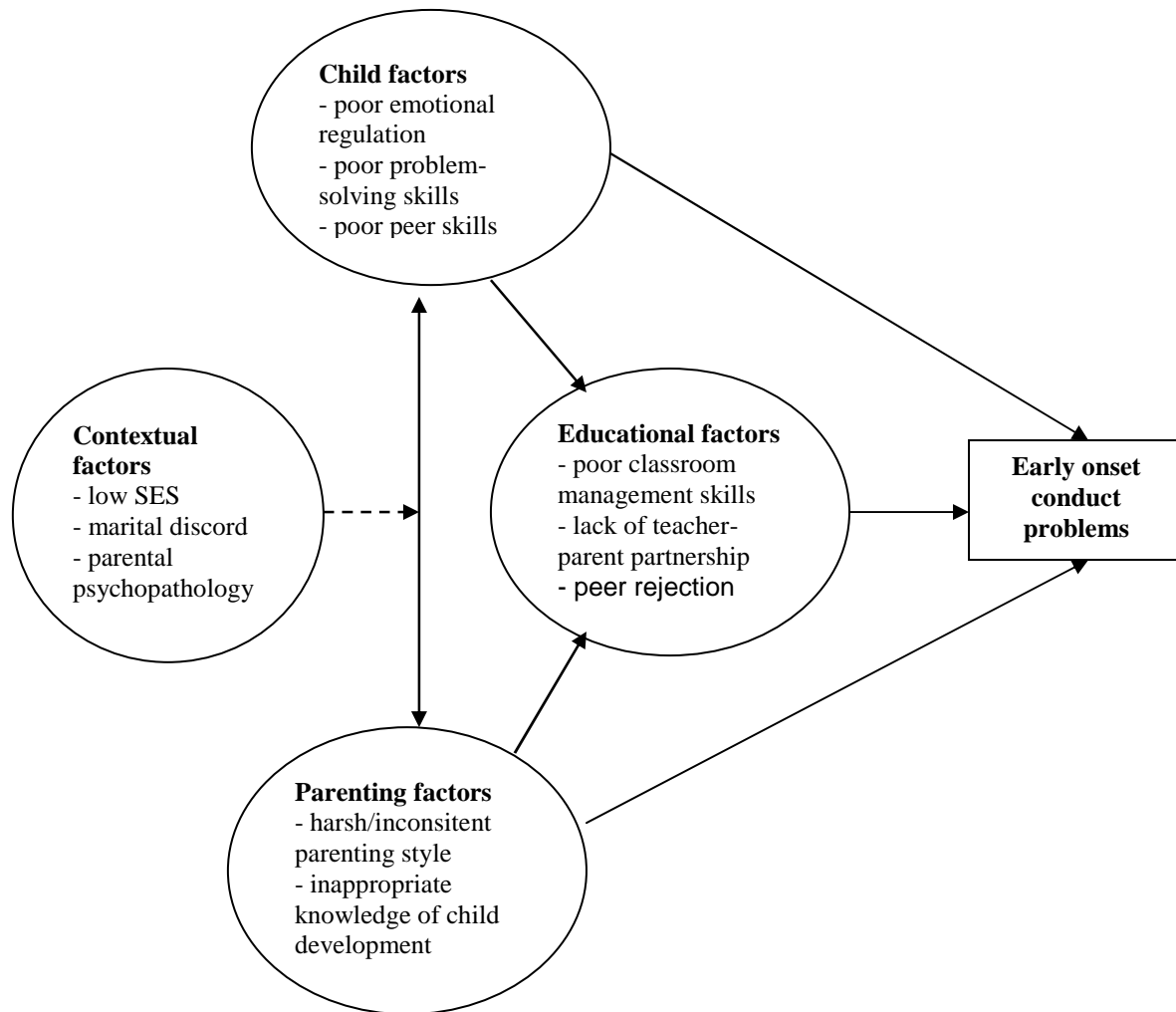
## **2. A DESCRIPTIVE MODEL OF DEVELOPMENTAL PATHWAYS IN EARLY ONSET CONDUCT PROBLEMS**

The first step in understanding how to conduct interventions for preventing early onset conduct problems, requires an understanding of relevant developmental pathways, risk as well as protective factors which need to be targeted by such interventions. We propose the following model in order to better understand the developmental pathways involved in early onset conduct problems, and their respective interactions (Fig. 1). This model constitutes a modified version of a descriptive model previously developed by Webster-Statton & Taylor (2001).

Primarily there are intrapersonal deficient emotional and social competencies, which as seen are especially predictive of behavioral problems (Denham, Mason, Caverly, Schmidt, Hackney et al., 2001; Eisenberg, Sadovsky, Spinrad, Fabes, Losoya, et al., 2005; Hastings et al., 2000). It is also proved that children with low social and emotional competencies are often perceived as more challenging by their parents (Nicholson, Fox, & Johnson, 2005), because they are more likely to exhibit high rates of misbehaviors. This in turn leads to increased parental difficulties in managing their children's negative behaviors, and could determine parents to use more frequently harsh or inconsistent discipline strategies (Nicholson et al., 2005), which both have been shown to be highly predictive of children's conduct problems (Bradley, & Corwyn, 2007; Cole, Teti, & Zahn-Waxler, 2003; Denham, Workman, Cole, Weissbrod, Kendziora et al., 2000). However, the relationship between child and parental risk factors is bidirectional, meaning that inappropriate parenting strategies might also negatively influence a child's

developmental trajectory. Lack of supportive and consistent environments at home negatively influence children’s ability to develop age-appropriate behaviors.

Figure 1. Interactions between intrapersonal and interpersonal risk factors for early onset conduct problems



At this point, another risk factor may influence a child’s future development, namely contextual risk factors, which act as mediators between parenting style and behavioral outcomes (Curtner-Smith, Culp, Culp, Scheib, Owen et al., 2006; Sturge-Apple, Davies, & Cummings, 2006). That means that parents subject to one or multiple contextual stressors are more likely to use harsh or inconsistent discipline methods, which in turn affect negatively children’s competence development. And finally, when children enter preschool educational settings their misbehavior tends to be reinforced by preferential interaction with children who exhibit similar problems (Vaughan, Mundy, Acra, Block, Delgado et al., 2007). Because of their aggressive patterns of interaction, these children are rejected by their peers and form friendships with other children who lack adequate emotional and social skills (Maguire & Dunn, 1997; Seban, 2003). Moreover, if teachers have problems in managing children’s classroom behavior, these maladaptive patterns become more stable (Snyder, Cramer, A Frank, & Patterson, 2005). In other words, teachers who are not able to manage classrooms where more children have similar problems, become more directive and harsh in their discipline style (Lewis, 1999). Also, there are empirical evidence suggesting that parent-teacher partnerships that promote common discipline strategies and interventions are less likely to be implemented if teachers do not take

steps and use strategies for promoting their communication with the parents (Knopf & Swick, 2007; Vickers & Minke, 1995).

Interactions between these risk factors increase the likelihood of children acquiring early onset conduct problems. Any early education intervention can be considered effective if it is able to produce change in any of these risk factors. Following is a brief analysis of preventive interventions targeting one or more risk factors.

### **3. INTERVENTION STRATEGIES TARGETING RISK FACTORS INVOLVED IN EARLY ONSET CONDUCT PROBLEMS**

Having identified the developmental pathways involved in early onset conduct problems, the next step is to establish how prevention programs target children's risk factors. Prevention programs can be defined according to the severity of risk. Primary (universal) prevention programs are designed for the general preschool population irrespective of their risk status, secondary (indicated/selective) prevention programs are designed for children exhibiting high risk for developing conduct problems, while tertiary (early intervention) prevention programs target children already exhibiting specific symptoms of a conduct problem, in order to decrease possible negative effects associated with mental health problems (Durlak & Wells, 1998). The difference between indicated and selective interventions is that indicated interventions target children with risk established by assessing their competence development and level of behavior problems, while selective interventions target children based on external risk factors (e.g., low SES communities, high juvenile delinquency rates, etc.).

In this section, we focus on community-based interventions which are more widely used because of their ability to target more children in need of intervention as opposed to programs which are delivered in clinical settings. Most community-based interventions include a skill-based approach, targeting emotional and social development. Most often such **universal interventions** (primary prevention) have proved to be effective in improving children's competencies, but they have been criticized for not being suitable to detect changes in children's externalizing behaviors, due to the fact that only a small proportion of children with behavior problems are included in these community-based interventions (Dadds, Holland, Laurens, Mullins, Barret, & Spence, 1999; Stoolmiller, Eddy & Reid, 2000). The first step towards improving their efficiency was the inclusion of teacher trainings, which were oriented towards improving teacher's classroom management strategies (Conduct Problems Prevention Research Group [CPPRG], 1999b; Webster-Stratton, Reid, & Stoolmiller, 2008). Second, some interventions also included consultations facilitating the implementation of activities designed to develop emotional and social competencies (Kam, Greenberg, & Walls, 2003). Another widely used strategy was to address issues regarding high risk children by including small group training for high risk children. However, some authors have suggested that in fact high risk children do not benefit from pull-out intervention sessions because acquiring social skills is mainly a process sustained by interactions with other children, mostly those with better developed skills (Lochman & Wells, 2002; van Lier, Vuijk, & Crijnen, 2005). However, the inclusion of teacher trainings has shown positive effects on reducing children's externalizing problems in the classroom especially for high risk children targeted by **indicated/selective interventions** (secondary prevention) (Raver, Jones, Li-Grining, Zhai, Metzger et al., 2009; Webster-Stratton, 1998; Webster-Stratton, Reid, & Hammond, 2001).

Another concern faced by early education program developers was the fact that strategies and skills that children usually acquire in classroom do not generalize to parent-child interactions at home (Hughes, Cavell, Meehan, Zhang, & Collie, 2005). One mechanism involved in these positive effects is related to changes in parent negative discipline strategies, which are robust predictors of children's conduct problems (Dodge & Pettit, 2003). Parents are taught positive discipline strategies in response to children's misbehaviors and are encouraged to



use praise and reward positive behaviors (Brotman, Gouley, Chesir-Teran, Dennis, Klein et al., 2005; Webster-Stratton, 1998). Training in behavior intervention techniques has been consistently used in early intervention/psychotherapeutic interventions in order to minimize children's disruptive behaviors (Webster-Stratton & Hammond, 1997). This approach has been transferred from such interventions to community-based settings. Some authors argued that parent training should only be delivered for parents of high risk children, but such an approach might determine less receptiveness and interest in complying with the program, since it induces stigmatization and feelings of inadequacy (Dadds & Roth, 2008). An interesting solution to this problem was provided by the *Triple P – Positive Parenting Program*, which followed a “minimally sufficient” framework for providing parents with the least amount of intervention needed in order to deflect children from a possible negative developmental trajectory towards conduct problems (Turner & Sanders, 2006; Zubrick, Ward, Silburn, Lawrence, Williams et al., 2005). Universal interventions were aimed at informing and educating parents regarding children's development, while indicated intervention methods targeting mild problems used brief consultation formats in order to elicit changes in children's and parents' behaviors. Moreover, these interventions do not rely solely on behavior management strategies, but these are complemented by teaching parents how to support their children's emotion regulation and problem-solving skills (Webster-Stratton, Reid, & Hammond, 2004).

Research on the impact of parental trainings have shown both improved competence ratings from parents, as well as lower levels of externalizing problems for high risk children (Webster-Stratton et al., 2001; Webster-Stratton, Reid, & Hammond, 2004). Taking into account the arguments presented above, it is clear that a program's efficiency is highly related to its ability to adequately target multiple risk categories by incorporating multifocused activities for children, teachers and parents.

## **Chapter 2. A NOMOTHETIC APPROACH TO EVIDENCE-BASED PREVENTION PROGRAMS**

### **Study 1. A COMPARATIVE STUDY ON THE EFFICACY OF A MULTIFOCUSED PREVENTION PROGRAM FOR CHILDREN'S EMOTIONAL AND SOCIAL COMPETENCIES DEVELOPMENT: CLASSROOM EFFECTS**

#### **1. INTRODUCTION**

In accordance with previous research by the *Fast Track* research group (CPPRG, 1999a; 1999b), we integrated simultaneously the provision of universal (for all children) and indicated intervention (at risk for conduct disorders). While this program included pull-out sessions for at risk children and parent training was implemented exclusively for high risk parents, our approach is consistent with the notion that these children benefit the most in terms of skill building from interactions with all children in their classroom (van Lier et al., 2005), and that parents might refuse to attend the intervention after being singled out. In turn, we included in the teacher training specific behavior management strategies, as well as coaching methods for developing high risk children's competencies. Second, the parent trainings were developed in ways to maximize parents' interest by including in a short 4 session group training a variety of information that would cover issues from discipline strategies to child developmental milestones and ways in which parents can support the improvement of emotional and social skills. Moreover, we provided parents with the possibility of attending individual training sessions. Thus, our assumption is that the same program, but different intervention mechanisms are responsible for children's outcomes at the two intervention levels. Low risk children benefit from the classroom curriculum and from the information component of the parent training,

which allows transfer of knowledge from classroom to at home interactions. High risk children are supposed to benefit from the classroom curriculum and teacher training, as well as from developing parents' discipline strategies and coaching strategies.

Another element introduced in this study was the strategy for determining children's risk status. Previous procedures involved in determining risk either employed teacher/parent evaluations of conduct problems (Webster-Stratton et al., 2008), or delinquency/juvenile arrest in a given area (CPPRG, 1999a; 1999b), and parental low socio-economic status (Raver et al., 2009). The procedure we opted for was a two-stage screening procedure similar to that presented in their meta-analytic review by Durlak & Wells (1998): 1) assessment of skill development status (bottom 10%); and 2) identifying further risk for externalizing problems. Moreover, we established separate screening for emotional and social competencies, because there is empirical evidence suggesting that although these competencies are highly interrelated, we can actually speak about two sets of competencies (Denham, 2007; Halberstadt, Denham, & Dunsmore, 2001).

## 2. OBJECTIVES

In this study we report initial efficacy findings regarding the intervention's effects on children's classroom behaviors. Results are discussed at two intervention levels, universal and indicated. Based on screening procedures for deficient emotional and social competencies, three risk categories were identified: high, moderate, and low. Thus, the children in the high risk group were the targets of the indicated intervention, while children from the moderate and low risk groups were receivers of the universal intervention. The inclusion of the moderate risk group was established by taking into account previous prevalence reports indicating that one third of all preschool children exhibit signs of behavioral and emotional problems, which may result in adverse long-term outcomes (Prinz & Sanders, 2007). In other words, the moderate risk group comprised children with normative development, but who on long term might be at risk, if the skill acquisition trend follows a negative trajectory.

Second, we were interested in determining whether employing separate classification screening criteria would yield different intervention effects on children's behaviors. Previous data from efficacy studies relied largely on questionnaires evaluating children's social competencies, and our hypotheses for social competence risk groups were built according to these data. In turn, for emotional competencies this study is exploratory. In consequence, we were interested in determining the intervention's efficacy on children's classroom behaviors which were assessed by teacher-rated questionnaires, and experimental strategies.

According to previous research we expect to find significant changes for:

- all risk groups (universal + indicated intervention level) concerning higher ratings of teacher assessed social competence, as well as better developed declarative knowledge in terms of emotion recognition, and positive problem-solving strategies (CPPRG, 1999a; 2002; Webster-Stratton et al., 2008), but the effects should decrease as a function of lower risk levels
- high risk children (indicated intervention) in terms of lower levels of teacher rated externalizing problems (Raver et al., 2009, Brotman et al., 2005), but not for non-risk children (Domitrovich, Cortes, & Greenberg, 2007); concomitantly we expect to find significantly less negative problem-solving strategies, although such findings were reported only for clinically referred children (Webster-Stratton & Hammond, 1997)
- all risk categories (universal + indicated intervention level) in terms lower levels of teacher rated internalizing problems (Domitrovich et al., 2007; Kam et al., 2004; Raver et al., 2009).

### 3. METHOD

#### 3.1. Participants

Participants were selected from 14 preschool classrooms, so that each classroom from a location would be matched with a similar age group from the same location. Children from 7 classrooms were assigned (*via* lottery) to the intervention group, and the other half to the control group. The initial sample consisted of 204 children (121 intervention and 83 control) from preschools in the urban area of Cluj-Napoca (Romania), for which we obtained parental consent to participate in this study (initial number of parents approached for the study was 275).

The data gathering process was initiated in early 2009, and further assessments took place in the summer (postintervention), and autumn (follow-up) of the same year. Thirty-two out of the intervention participants (26%) and 14 from the control group (17%) did not complete one or both summer postintervention assessments. Drop-out rates between 15-30% indicate a normal attrition rate for this type of study. The final sample included 89 children (42 boys and 47 girls) in the intervention group and 69 children (29 boys and 40 girls) in the control group with mean ages of 50.7 months ( $SD = 0.50$ ), and 48.6 months ( $SD = 0.53$ ), respectively.

#### 3.2. Design

We used a 2×3 quasi-experimental design, with intervention and control (no intervention) groups, which were assessed at three time points: preintervention, postintervention (4 months after the preintervention assessment), and at 3-months follow-up. Since we used classrooms in assigning children to one of the two conditions, this was a partially randomized design. Data were analyzed using an intent-to-treat method, including all children and parents irrespective of the received intervention dosage.

#### 3.3. Intervention

##### 3.3.1. Classroom activities

The curriculum for children's emotional and social development included 37 classroom activities implemented by teachers. The intervention took place over 15 weeks with a frequency of 2-3 activities/week. The curriculum contained 5 intervention modules, which aimed the development of both emotional and social competencies.

*Compliance to rules.* The main objective of the activities in this module was to familiarize children with classroom rules. Among the strategies were antecedent-based strategies such as introducing the rules through role-play, verbal prompting, as well as visual cues (e.g., drawings). These strategies were associated with consequence-based strategies such as establishing rewards for appropriate rule behaviors, or logical consequences for misbehaviors.

*Emotion recognition.* The activities in this module were aimed towards developing children's abilities to name and recognize emotions such as happiness, anger, sadness, and fear. Children became familiar with emotion recognition through a number of activities involving stories, mime games, and drawing. Also, children were presented with vignettes in which they were asked to identify emotions and establish consequences for those emotion-eliciting situations.

*Emotion regulation.* The main objective of the emotion regulation module was to familiarize children with the "turtle technique". This technique is effective in preventing anger outbursts, and teaches children to find adequate solutions to frustrating events. The "turtle technique" was introduced through story telling. Children were also shown puppet plays, in which the characters became angry and misbehaved. They were encouraged to think about how would the little turtle handle the situation, and were provided with opportunities to role-play the solutions.

*Problem-solving.* The aim of this module was to familiarize children with problem-solving strategies such as sharing, turn-taking, waiting. Children were introduced through puppet play a series of common situations that could lead to conflicts between children, or with adults. They were either asked to evaluate the solutions provided by the characters in the story/vignette, or to find themselves solutions. In both types of activities, children were then required to role-play adequate solutions to these problems.

*Play cooperation.* The objective of the activities in this module was to teach children about behaviors that help establish and maintain friendships. Using stories, teachers asked children to determine, which behaviors were friendly and which not, as well as role play friendly behaviors. Also, play activities were used to exercise cooperation between children. Teachers gradually increased the number of children in the play groups and coached them to use solutions such as turn-taking, sharing, or waiting to get access to a toy during daily play sessions.

### **3.3.2. Teacher training**

Teacher training was 12 hours long and was delivered in the form of group workshops. Teachers participated to three modules of intervention targeting classroom management strategies (2 sessions/2.5h), communication and teacher-parent partnership (1 session/2h), and consultations for implementing activities from the classroom curriculum (5 sessions/1h).

*Classroom management strategies.* This part of the training was focused on developing teacher's knowledge about discipline strategies. Three categories of strategies were discussed: preventive strategies, reinforcement, and punishment. Preventive strategies included rules, instructions and routines. Also the use of rewards and social reinforcements were discussed as methods for motivating children's appropriate behaviors, while specific strategies for reducing the rates of negative behaviors were also introduced (e.g., ignoring, logical consequences, timeout). Handouts and work sheets were provided for exercising this knowledge. For each strategy the trainer provided examples, as well as step-by-step guidelines for implementing them. Teachers were asked to apply the acquired knowledge to case studies and role-played the strategies, in order to help them identify possible problems that they might encounter while using these techniques.

*Communication and parent-teacher partnership.* Effective communication strategies were introduced based on examples and work sheets. Teachers exercised "I" statements through role-play and were taught how to deal with discussions about children's emotions. The second part of this session was used in order to identify means of developing parent-teacher partnerships. Teachers proposed activities that would allow parents' regular involvement in their children's activities. Also, teachers were asked to role-play situations in which they would have to discuss with a parent about their child's misbehaviors. The trainer guided the role-play pointing out possible communication faults that trigger defensive responding from the parents.

*Consultations for implementing activities from the classroom curriculum.* Five consultations occurred prior to each module of activities for children. These consultations had a similar pattern of discussion points: developmental milestones for a particular competence, methods for developing that competence, and going over the content of the child-focused activities in the module. Teachers were taught how to coach and assist these children in learning efficient ways to deal with anger, to problem-solve, or guide them in their play interactions with other children in the classroom.

### **3.3.3. Parent training**

The parent training included group training sessions and individual training sessions, the latter being held at the parents' request. The aims of the parent intervention were: 1) reducing the frequency of harsh and inconsistent discipline strategies; 2) increasing the frequency of

appropriate discipline strategies (e.g., ignoring, logical consequences, time-out) for children's negative behaviors, as well as the use praise and rewards for children's adequate behaviors; and 3) improving parents' knowledge of children's development and acquiring strategies for sustaining children's emotional and social development.

**Group training** included four sessions lasting between 90-120 minutes each. Each session of the group training included three major topics covering information about milestones for preschooler's emotional and social development, strategies that parents may use in order to assist them in acquiring these competencies, as well as discipline strategies. During each session the parents were provided with handouts, worksheets for solving exercises, as well as role-played different strategies. At the end of each module, parents received homework assignments, which included applying strategies for children's emotional development and a self-monitoring exercise regarding parents discipline strategies in response to children's positive and negative behaviors.

**Individual training** sessions were 20-30 minutes long and were held only on parents' request. These sessions took the form of problem-solving: the trainer and the parent identified the problem, and then established together an intervention plan based on the functional analysis of the behavior. Parents were provided by the trainer with a follow-up session in order to evaluate outcomes, and take appropriate steps if it did not.

### 3.5. Assessment

#### 3.5.1. Teacher assessment of emotional and social competencies

**Screening.** We used two separate measures for emotional and social competencies development namely *Emotion Competence Screening for Preschoolers – Teacher Form* (ECS-T) and *Social Competence Screening for Preschoolers – Teacher Form* (SCS-T) (Miclea, Porumb, Porumb, & Porumb, 2010; Ștefan, Bălaj, Porumb, Albu, & Miclea, 2009). The ECS-T scale contains 10 items measuring emotion understanding, emotion expression and emotion regulation (e.g., “The child recognizes that others feel happy, angry, sad, or afraid”, “When scolded or praised, the child expresses the adequate emotion”). The SCS-T scale is made up of 15 items assessing compliance to rules, interpersonal skills and prosocial behaviors (e.g., “The child easily accepts changes in game rules”, “The child plays with more than three children at once”). Responses for each item were coded on a 5-point Likert scale, where 1 = *almost never* and 5 = *almost always*. Both ECS-T and SCS-T showed high internal consistency, Cronbach's  $\alpha$  ranging from .88-.92, and from .88 to .91, respectively.

**Social competence.** Children's social competencies were also assessed using the *Social Competence and Behavior Evaluation – Preschool Edition* (SCBE; LaFreniere & Dumas, 1995). The Social Competence summary scale is comprised of 40 items from the positive poles of the eight basic scales measuring the following constructs: Joyful, Secure, Tolerant, Integrated, Calm, Prosocial, Cooperative, Autonomous (e.g., “Patient and tolerant”; “Children seek him/her out to play with them”). Each item was coded on a 6-point Likert scale, where 0 = *almost never* and 6 = *almost always*. Cronbach's  $\alpha$ s ranged from .80 to .86, indicating high internal consistency.

#### 3.5.2. Teacher assessment of externalizing and internalizing problems

**Externalizing problems.** We opted for the Externalizing Problems summary scale from SCBE (LaFreniere & Dumas, 1995), consisting of 20 items from the four negative poles of the basic scales Angry, Aggressive, Egotistical, and Oppositional (e.g., “Bullies weaker children”, “Refuses to share toys”). Each item was evaluated on a 6-point Likert scale, where 0 = *almost never* and 6 = *almost always*, and the resulting scores were reverse coded, meaning that a higher

score on this scale corresponds to lower levels of behavior problems. The internal consistency for the three assessments varied between  $\alpha = .84 - .88$ . The cut-off scores for the Romanian sample were established using the split-half method.

**Internalizing problems.** Teachers also rated children on the Internalizing Problems scale from SCBE (LaFreniere & Dumas, 1995). This measure of 20 items from the negative poles of the following the basic scales: Depressive, Anxious, Isolated, and Dependent (e.g., “Worries”, “Inactive, watches other children play”). Each item was coded on a 6-point Likert scale, where 0 = *almost never* and 6 = *almost always*. Cronbach’s  $\alpha$  were .82 to .86 showing high internal consistency for this scale.

### 3.5.3. Child direct assessment of emotion recognition and problem-solving strategies

**Emotion recognition.** For the emotion recognition task we used a modified version of the *Affective Knowledge Test* (AKT; Denham, 1986), replacing the original “puppet task” involving smiley-type facial features, with an ecological set of stimuli consisting of human faces selected from the NimStim data base. We selected a set of male faces for boys and one of female faces for girls based on the sets which produced the most correctly identified emotions. The expressive task was designed to assess children’s ability to name the following emotions: happiness, anger, sadness, and fear, while the receptive task was designed to assess their ability to recognize these emotions based on facial cues. Children were first evaluated on the Expressive task, and then on the Receptive task. The children in this study were presented with a computerized version of the task. For the Expressive task each child viewed four 14/14 cm cards with male or female faces and was asked to say “how does he/she feel”. In the Receptive task, all the cards were shown to the child and the child was asked “which one feels happy/sad/fearful/angry”. For each child the order of presentation was counterbalanced in both tasks. Two blind coders rated separately the children’s performance. Intraclass correlation coefficients (ICCs) for the expressive task ranged from .92 to .96 for happiness, .91 to 0.93 for anger, .87 to .91 for sadness, and .84 to .86 for fear. The same indices for the receptive task were ICC(2,1) = .95-.97 for happiness, ICC(2,1) = .94-.95 for anger, ICC(2,1) = .92-.94 for sadness, and ICC(2,1) = .91-.94 for fear.

**Social problem-solving.** In order to assess children’s problem-solving skills we used a modified version of the *Social Problem Solving Test* (SPST-R; Webster-Stratton, 1990). From the initial thirteen vignettes we used the following five situations: adult disapproval (#1), rejection from a friend (#2), toy access (#3), unjust treatment from another child (#4), and making a mistake (#5). Each child was presented the vignettes together with a picture depicting the situation in order to facilitate their answers. After each vignette, the child was asked to say “what would he/she do”. The answers were included in two categories: positive strategies (P), and negative strategies (N). Positive strategies referred to apologizing, finding another toy or friend to play with, asking for help from an adult, etc.; in the negative category we included aggressive behaviors such as hitting, name calling, destroying a toy, non-compliance and lying. ICCs ranged from .88 to .91 for positive problem-solving strategies, and .84 to .87 for negative problem-solving.

## 4. RESULTS AND DISCUSSION

### 4.1. Data analysis strategy

The statistical procedure involved a 2×3 mixed ANOVA with a between-subject variable (intervention vs. control) and a within-subject variable (pre- vs. postintervention vs. follow-up). Within group comparisons were conducted using a Bonferroni correction: 1) pre- to postintervention; 2) preintervention to follow-up; and 3) postintervention to follow-up. If the within group comparisons showed the presence of significant intervention group changes, we

proceeded to running independent samples  $t$  tests on postintervention and follow-up scores in order to find significant group differences.

## 4.2. Results and discussion for the indicated intervention level

### 4.2.1. Results for the high risk groups

#### 4.2.1.1. Emotional competence

**Emotional competence.** For teacher rated emotional competence, we found a significant time by group interaction effect,  $F(1, 26) = 9.27, p < .001$ . Intervention group children scored significantly higher than control group children,  $t(26) = 2.44, p < .05 (d = 0.97)$ . At 3-months follow-up, between group comparisons showed the intervention's effect was maintained,  $t(26) = 2.81, p < .01$ .

**Social competence.** There was a significant interaction effect for the screening instrument ( $p < .001$ ). Although marginally significant ( $p < .10$ ) group differences were found immediately after the intervention, these became significant at follow-up,  $t(26) = 2.03, p < .05$ , but this effect cannot be attributed to the intervention. Teacher rated social competencies by SCBE indicated only a marginally significant interaction effect ( $p < .10$ ).

**Externalizing problems.** We found a significant time by group interaction effect for teacher evaluated externalizing problems,  $F(1, 26) = 11.16, p < .001$ . This trend was confirmed by the fact that intervention group children showed significantly less frequent aggressive and oppositional behaviors than control group children postintervention,  $t(26) = 2.18, p < .05 (d = 0.86)$ . At follow-up, the effects of the intervention were maintained,  $t(26) = 3.35, p < .01$ .

**Internalizing problems.** For ratings of internalizing problems we found a significant interaction effect,  $F(1, 26) = 6.40, p < .01$ . These findings were confirmed by significant postintervention differences between the intervention and control group,  $t(26) = 3.02, p < .01 (d = 1.17)$ . The maintenance of intervention effects was confirmed by the fact that follow-up scores were significantly higher in the intervention group compared to the control group,  $t(26) = 2.80, p < .01$ .

**Emotion recognition.** Analysis on the data from the expressive task of emotion recognition indicated a significant interaction effect ( $p < .001$ ). The rate of improvement regarding the ability to correctly name emotions was significantly higher for the intervention group,  $t(26) = 2.08, p < .05 (d = 0.80)$ . At follow-up, intervention group children still performed significantly better in naming emotions compared to control group children,  $t(26) = 3.08, p < .01$ . In the case of the receptive task, there was no significant interaction effect ( $p > .10$ ).

**Social problem-solving.** There were no significant interaction effects for either positive or negative problem-solving strategies ( $p$ 's  $> .05$ )

Means, standard deviations,  $F$  values for the interaction effect, pre-postintervention, and preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 1.

#### 4.2.1.2. Social competence

**Social competence.** For the teacher rated social competence, there was a significant interaction effect  $F(1, 25) = 5.16, p < .01$ . Also, intervention group children were rated significantly better on the screening measure by their teachers compared to control group children,  $t(25) = 2.57, p < .05 (d = 0.96)$ . For the SCBE we also obtained a significant interaction effect  $F(1, 25) = 4.15, p < .05$ . As expected, the intervention group showed significantly higher gains in social competencies compared to the control group,  $t(25) = 2.66, p < .05 (d = 1.05)$ . Results confirmed the maintenance of intervention effects for SCS-T ratings,  $t(25) = 2.32, p < .05$ , and for the SCBE,  $t(25) = 2.16, p < .05$ .

Table 1. Pre-, postintervention, and follow-up scores by group for high risk emotional competence children's classroom behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
ECS-T	33.50	1.97	44.50	6.47	45.92	4.68	34.58	1.56
SCS-T	43.75	6.77	54.19	8.57	55.69	7.20	46.33	6.44
SCBE Social Competence	77.69	22.28	106.88	15.00	116.75	13.19	84.92	20.39
SCBE Externalizing	61.94	13.52	74.13	7.84	83.44	10.34	61.00	14.83
SCBE Internalizing	61.06	14.41	73.31	7.26	77.06	7.42	65.33	7.23
AKT Expressive	2.38	1.96	5.75	1.53	6.19	1.52	3.33	1.50
AKT Receptive	3.94	2.59	6.91	1.76	6.63	1.41	3.83	2.92
Positive problem-solving	0.36	0.23	0.71	0.23	0.76	0.22	0.48	0.27
Negative problem-solving	0.07	0.11	0.01	0.05	0.01	0.05	0.03	0.08

Note: ECS-T = Emotion Competence Screening-Teacher; SCS-T = Social Competence Screening-Teacher; SCBE = Social Competence and Behavior Evaluation; AKT = Affective Knowledge Test

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

**Emotional competence.** Time by group interaction effect was significant for ECS-T,  $F(1, 25) = 10.46$ ,  $p < .01$ . Intervention group children were rated significantly better by their teachers compared to control group children,  $t(25) = 2.29$ ,  $p < .05$  ( $d = .90$ ). At follow-up, intervention group children were still rated significantly higher on emotional competencies, indicating a maintenance of intervention's effects,  $t(25) = 2.60$ ,  $p < .05$ .

**Externalizing problems.** Teacher ratings of externalizing problems showed a significant interaction effect ( $p < .01$ ). The trend from the intervention group was confirmed by significantly lower levels of problem behaviors compared to control group children,  $t(25) = 2.27$ ,  $p < .05$  ( $d = 0.87$ ). At 3 months follow-up, intervention group children were still rated as having significantly less externalizing problems,  $t(25) = 3.08$ ,  $p < .01$ .

**Internalizing problems.** Independent samples  $t$  test confirmed that there was significant improvement in behaviors associated with internalizing problems compared to the control group,  $t(25) = 3.05$ ,  $p < .01$  ( $d = 1.21$ ). The intervention maintained its effects,  $t(25) = 3.45$ ,  $p < .01$ .

**Social problem-solving.** Because we found significant preintervention difference between the two groups on positive problem solving strategies, we used ANCOVA for analyzing these data. Covarying pretest data on postintervention scores we found that intervention group children used significantly more positive problem-solving strategies than the control group children,  $t(25) = 2.56$ ,  $p < .05$  ( $d = 0.64$ ). ANCOVA analysis covarying preintervention scores on follow-up scores indicated that the intervention effects were maintained,  $t(25) = 2.00$ ,  $p < .05$ . Also, there was a significant interaction effect for the total of negative problem-solving strategies ( $p < .05$ ). Intervention group children used significantly less aggressive and non-compliant solutions than control group children,  $t(25) = -2.12$ ,  $p < .05$  ( $d = 0.71$ ). ANCOVA on follow-up data covarying preintervention results showed that the intervention's effects were maintained,  $t(25) = 2.99$ ,  $p < .01$ .



Control group (CON)				ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests	
Post		FU			INT	CON	INT	CON
M	SD	M	SD					
39.17	4.24	41.75	2.45	9.27***	7.81***	4.37**	11.60***	9.59***
49.50	7.38	50.58	5.60	7.96**	6.44***	2.29	8.61***	3.22 <sup>†</sup>
101.00	20.35	112.25	18.91	3.58 <sup>†</sup>	9.47***	3.48*	8.41***	5.85***
65.00	12.79	68.58	13.12	11.16***	6.02***	1.56	7.57***	2.82 <sup>†</sup>
65.50	6.05	69.50	7.87	6.40**	4.39**	-0.07	4.58**	1.47
4.58	1.38	4.50	1.31	10.46**	6.55***	4.10**	6.76***	3.19 <sup>†</sup>
6.08	2.11	5.83	2.48	0.33	4.91***	2.85 <sup>†</sup>	4.63***	2.23
0.63	0.32	0.69	0.25	2.97 <sup>†</sup>	5.70***	1.51	7.66***	2.57 <sup>†</sup>
0.03	0.08	0.02	0.06	1.45	-2.15	0.00	-1.76	-1.00

**Emotion recognition.** There were significant interaction effects for both expressive and receptive tasks ( $p$ 's < .05). In both cases we used ANCOVA's to detect group effects. For the expressive task, we found  $t(25) = 2.10$ ,  $p < .05$  ( $d = 0.60$ ), indicating that intervention group children performed significantly better in naming emotions compared to control group children, and these results were maintained at follow-up,  $t(25) = 2.99$ ,  $p < .01$ . However, for the receptive emotion recognition there was no difference in group performance ( $p > .05$ ).

Means, standard deviations,  $F$  values for the interaction effect, pre-postintervention, and preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 2.

#### 4.2.2. Discussion for the high risk groups

As noted in the objective section our study was exploratory in terms of differentiating between emotional and social competencies. Data from the social competence group are consistent with previous findings on high risk children (Raver et al., 2009; Webster-Stratton et al., 2001; Webster-Stratton et al., 2008), indicating that these children benefit from exposure to skill development strategies. Gains in social competencies were followed by significant improvements in children's emotional competencies.

These results from the teacher-ratings were sustained by the development of declarative knowledge. For the expressive task of emotion recognition, children were asked to name emotions based on facial cues. Previous studies have found that high risk children benefit in terms of improved language abilities (Webster-Stratton et al., 2008), a category of declarative knowledge which are essential for children's ability to interpret cues from social interactions (Izard, Fine, Schultz, Mostow, Ackerman, et al., 2001; Schultz, Izard, & Ackerman, 2000). Positive problem-solving strategies such as compliance, toy sharing, reorienting attention, were employed consistently by intervention group children.

Table 2. Pre-, postintervention, and follow-up scores by group for high risk social competence children's classroom behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
SCS-T	40.75	4.84	51.50	8.38	54.06	6.27	42.00	3.13
SCBE Social Competence	71.50	18.55	102.86	15.11	114.31	14.78	68.45	18.14
ECS-T	34.88	3.32	44.00	6.04	45.63	4.22	37.36	4.18
SCBE Externalizing	63.19	14.40	73.50	10.61	78.50	13.74	59.18	12.14
SCBE Internalizing	63.13	13.66	71.81	9.57	78.00	5.89	59.73	6.08
Positive problem-solving	0.29	0.21	0.73	0.20	0.78	0.19	0.47	0.27
Negative problem-solving	0.10	0.13	0.01	0.05	0.01	0.05	0.07	0.12
AKT Expressive	2.44	2.00	5.50	1.71	6.06	1.61	4.09	1.81
AKT Receptive	3.50	2.34	6.63	1.78	6.56	1.63	6.18	2.44

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

This effect is entirely consistent with previously reported results from one other study on high risk children (Webster-Stratton et al., 2008). On the other hand, finding significant reductions in negative problem-solving strategies represents the first time when such results are found in non-clinical samples (Webster-Stratton & Hammond, 1997; Webster-Stratton & Reid, 2003).

Teacher rated externalizing problems showed that the intervention was effective in reducing the frequency of behaviors associated with conduct disorders. Although effects on children's behavior problems have been found in early intervention programs (Webster-Stratton et al., 2001), these data are among the few that show potential for classroom delivered interventions to produce positive outcomes for preschoolers. Other studies found similar effects in the context of added child training in small groups (CPPRG, 1999a), or using a similar intervention framework as ours (Lochman & Wells, 2002), but for school-aged children

We also found that high risk children show reduced levels of internalizing problems, which is a finding consistent with the data in the literature (Raver et al., 2009), which indicate the potential of programs used for preventing externalizing problems to alter mechanisms involved in internalizing problems. One possible explanation is that these interventions aim the development of cooperative play strategies, which might reduce isolation which is often related to children's lack of participatory play skills (Hay, Payne, & Chadwick, 2004; Spinrad, Eisenberg, Harris, Hanish, Fabes et al., 2004).

Interestingly, when emotional competencies assessment was used as predictor of risk, our results were slightly different from those from the social competence. This exploratory study indicated that although children significantly improved in terms of emotional competencies, these significant gains were not followed by significantly better developed social competencies. These data suggest that in fact the two competencies are independent. Moreover, we found significant skill improvements only for expressive emotion recognition, but not for positive or negative problem-solving strategies. On the other hand, there was a significant reduction in externalizing and internalizing problems, which might be explained by the fact that teacher's ratings are more sensitive to reductions in negative behaviors.

Control group (CON)									
Post		FU		ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests		
M	SD	M	SD		INT	CON	INT	CON	
45.00	4.69	48.65	5.48	5.16**	7.56***	2.27	9.73***	3.99**	
87.27	14.72	103.18	10.21	4.15*	9.93***	3.67*	7.72***	3.41*	
39.18	4.62	41.91	2.59	10.46***	5.75***	1.61	10.01***	4.05**	
62.91	13.66	62.64	12.24	3.77*	4.60**	1.29	4.28**	1.19	
60.00	8.22	67.27	9.48	8.24**	3.41*	0.53	4.75**	2.37	
0.57	0.29	0.68	0.22	6.54**	5.72***	1.37	5.18***	2.92 <sup>†</sup>	
0.08	0.13	0.05	0.09	3.78*	-2.84 <sup>†</sup>	1.00	-2.46 <sup>†</sup>	-0.41	
5.00	1.73	4.73	1.42	9.60***	5.14***	1.84	6.73***	1.35	
6.73	1.90	6.36	2.38	8.00***	4.76***	0.97	4.68***	0.32	

### 4.3. Results and discussion for the universal intervention level

#### 4.3.1. Results for the moderate and low risk groups

##### 4.3.1.1. Emotional competence – moderate risk group

**Emotional competence.** The analysis on the ECS-T scores yielded a significant time by group effect ( $p < .01$ ). The analysis indicated that intervention group children were rated significantly better than control group children,  $t(50) = 2.65$ ,  $p < .01$  ( $d = 0.72$ ). At follow-up intervention group children were still rated significantly better compared to their control group counterparts,  $t(50) = 2.06$ ,  $p < .05$ .

**Social competence.** SCS ratings of social competence yielded a significant interaction effect,  $F(1, 50) = 6.60$ ,  $p < .01$ . The group difference was only marginally significant in favor of the intervention group ( $p < .10$ ), the difference became significant at follow-up,  $t(50) = 2.12$ ,  $p < .05$ . For the SCBE social competence ratings we found no significant interaction effect ( $p > .05$ ).

**Externalizing problems.** For the externalizing problems we found a significant time by group effect ( $p < .001$ ). Intervention group children were rated as exhibiting significantly lower levels of externalizing problems compared to control group children,  $t(50) = 2.10$ ,  $p < .05$  ( $d = 0.57$ ). Intervention effects were maintained at follow-up,  $t(50) = 2.95$ ,  $p < .01$ .

**Internalizing problems.** A significant interaction effect was detected for teacher rated internalizing problems ( $p < .05$ ). Independent samples *t* test indicated a marginally significant difference in favor of the intervention group ( $p < .10$ ). Although there were no significant group differences immediately postintervention, follow-up comparisons yielded significantly less social isolation in intervention group children compared to control group children,  $t(50) = 2.39$ ,  $p < .05$ .

**Emotion recognition.** For the expressive component of emotion recognition, there was a significant interaction effect  $F(1, 50) = 7.04$ ,  $p < .001$ . Also, we detected significantly more correctly recognized emotions in intervention group children compared to the control group,  $t(50) = 3.01$ ,  $p < .01$  ( $d = 0.82$ ). Also, intervention effects were maintained,  $t(50) = 2.78$ ,  $p < .01$ .

Table 3. Pre-, postintervention, and follow-up scores by group for moderate risk emotional competence children's classroom behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
ECS-T	41.26	2.07	47.06	5.19	49.58	4.62	42.55	1.74
SCS-T	50.13	5.35	57.58	5.68	59.42	5.18	51.82	5.39
SCBE Social Competence	99.13	21.96	119.65	17.55	125.42	25.99	97.59	28.01
SCBE Externalizing	64.77	15.24	73.61	12.63	79.00	10.14	65.95	13.38
SCBE Internalizing	68.87	11.31	71.97	9.39	76.58	6.10	65.86	10.43
AKT Expressive	3.10	2.06	6.06	1.91	6.10	1.30	4.05	2.21
AKT Receptive	4.87	2.03	7.26	1.29	7.32	1.25	4.91	2.71
Positive problem-solving	0.46	0.29	0.84	0.19	0.85	0.17	0.46	0.31
Negative problem-solving	0.04	0.09	0.01	0.04	0.00	0.00	0.04	0.10

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

In the case of the receptive task, we found no significant interaction effect ( $p > .05$ ).

**Social problem-solving.** Intervention group children used significantly more positive problem-solving strategies compared to control group children  $t(50) = 3.36, p < .01$  ( $d = 0.99$ ). The group difference was still significant at 3 months follow-up, showing that the intervention's effects were maintained,  $t(50) = 3.10, p < .01$ . For negative problem-solving there was only a marginally significant interaction effect ( $p < .10$ ).

Means, standard deviations,  $F$  values for the interaction effect, pre-postintervention, and preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 3.

#### 4.3.1.2. Social competence – moderate risk group

**Social competence.** ANOVA's for social competence ratings by teachers for both SCS-T and SCBE indicated significant interaction effects ( $p$ 's  $< .01$ ). Intervention group children were rated significantly higher on social skills compared to control group children on the SCS-T,  $t(58) = 2.42, p < .05$  ( $d = 0.58$ ), as well as SCBE,  $t(58) = 2.17, p < .05$  ( $d = 0.56$ ). Intervention group children were still rated significantly better compared to control participants 3-months postintervention when measured by SCS-T,  $t(58) = 2.30, p < .05$ , as well as by SCBE,  $t(58) = 2.82, p < .01$ .

**Emotional competence.** Mixed ANOVA yielded a significant interaction effect for teacher rated emotional competencies,  $F(1, 58) = 4.30, p < .05$ . Intervention group children were rated significantly better compared to control group children immediately postintervention,  $t(58) = 2.04, p < .05$  ( $d = 0.52$ ). Also, intervention group children were still rated significantly higher on emotional competence at follow-up,  $t(33) = 2.32, p < .05$ .

**Externalizing problems.** For teacher rated externalizing problems we found a significant interaction effect ( $p < .01$ ). Significant postintervention differences in favor of the intervention group were confirmed,  $t(58) = 2.24, p < .05$  ( $d = 0.58$ ).

Control group (CON)									
Post		FU		ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests		
M	SD	M	SD		INT	CON	INT	CON	
44.09	2.71	46.77	6.23	7.46**	6.96***	2.39	11.67***	3.16**	
54.77	6.17	56.14	6.07	6.60**	6.70***	5.43***	8.88***	3.36**	
109.55	23.17	115.27	17.11	1.47	5.94***	4.22**	5.59***	3.37**	
65.55	15.34	69.18	14.08	10.25***	5.03***	-0.25	8.20***	2.60 <sup>†</sup>	
67.27	10.77	71.81	8.88	3.23*	1.90	1.04	4.33***	3.59**	
4.32	2.30	4.77	1.95	7.04***	7.22***	0.53	7.01***	1.29	
6.05	2.21	6.55	1.68	2.34	6.42***	2.58 <sup>†</sup>	6.41***	3.79**	
0.61	0.27	0.84	0.19	6.61**	8.38***	3.28*	8.71***	3.13*	
0.07	0.12	0.04	0.08	3.02*	-2.25 <sup>†</sup>	1.09	-2.69 <sup>†</sup>	-0.25	

Also, intervention group children were significantly less aggressive and non-compliant compared to control group children at follow-up,  $t(58) = 2.20$ ,  $p < .05$ , suggesting that these intervention's effects were maintained.

**Internalizing problems.** For teacher rated internalizing problems, intervention group children exhibited significantly less isolation and withdrawal compared to control group children,  $t(58) = 2.46$ ,  $p < .05$  ( $d = 0.52$ ). At follow-up, they exhibited significantly less isolation and negative emotionality compared to the control group,  $t(58) = 2.51$ ,  $p < .05$ , which indicated that the intervention's effects were maintained.

**Social problem-solving.** ANOVA on positive problem-solving strategies used by children yielded a significant interaction effect,  $F(1, 58) = 3.56$ ,  $p < .05$ . Intervention group children used significantly more positive problem solving strategies than control group children,  $t(58) = 2.39$ ,  $p < .01$  ( $d = 0.62$ ). The data indicate that in the case of positive problem-solving the intervention's effects were maintained,  $t(58) = 2.03$ ,  $p < .05$ .

We only found a marginally significant interaction effect for negative problem-solving strategies ( $p < .10$ ).

**Emotion recognition.** There was a significant time by group interaction effect for the expressive task,  $F(1, 58) = 10.32$ ,  $p < .001$ . Following independent samples *t* test showed that intervention group children named correctly significantly more emotions compared to control group children,  $t(58) = 3.22$ ,  $p < .01$  ( $d = 0.83$ ). At follow-up intervention group children outperformed control group children on this task,  $t(58) = 2.92$ ,  $p < .01$ . For the expressive task, there was a marginally significant interaction effect ( $p < .10$ ).

Means, standard deviations, *F* values for the interaction effect, pre-postintervention, and preintervention-follow-up paired samples *t* test values within each group can be found in Table 4.

Table 4. Pre-, postintervention, and follow-up scores by group for moderate risk social competence children's classroom behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
SCS-T	51.79	3.22	59.53	6.68	60.74	5.82	53.19	2.28
SCBE Social Competence	99.50	20.01	121.79	16.72	129.44	16.35	99.19	16.68
ECS-T	41.41	3.77	47.21	5.60	50.09	4.87	41.58	4.29
SCBE Externalizing	65.38	14.61	76.38	10.19	80.82	9.68	67.42	14.49
SCBE Internalizing	68.74	11.95	74.35	7.69	76.71	7.45	68.74	11.95
Positive problem-solving	0.51	0.29	0.78	0.25	0.81	0.20	0.47	0.28
Negative problem-solving	0.03	0.07	0.01	0.05	0.00	0.00	0.04	0.09
AKT Expressive	3.24	2.18	6.18	1.80	6.26	1.29	4.19	2.21
AKT Receptive	4.97	1.98	6.44	1.13	7.50	0.99	4.88	2.90

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

#### 4.3.1.3. Emotional competence – low risk group

**Emotional competence.** There was a significant time by group interaction effect ( $p < .01$ ), followed by significant group differences immediately postintervention,  $t(75) = 2.99$ ,  $p < .01$  ( $d = 0.68$ ). Subsequent analysis indicated the maintenance of intervention effects,  $t(75) = 2.45$ ,  $p < .05$ .

**Social competence.** Analysis for SCS and SCBE rated social skills showed a significant interaction effect ( $p < .001$ ). Also, intervention group children were rated significantly better compared to control group children on SCS-T,  $t(75) = 2.00$ ,  $p < .05$  ( $d = 0.46$ ), but the group difference was only marginally significant for the SCBE ratings ( $p < .10$ ). Analysis on group differences indicated that intervention group children were rated significantly better compared to control group children at follow-up on SCS-T,  $t(75) = 2.79$ ,  $p < .05$ . For the SCBE rated social competencies, we only found significant group improvements at follow-up,  $t(75) = 3.93$ ,  $p < .01$ .

**Externalizing problems.** We also found a significant interaction effect for teacher evaluated externalizing problems ( $p < .01$ ). However, immediately postintervention there were only marginally significant differences in favor of the intervention group ( $p < .10$ ). Only at follow-up, intervention group children showed significantly less problem behaviors,  $t(75) = 2.13$ ,  $p < .05$ .

**Internalizing problems.** Teachers also rated children on internalizing problems. The analysis yielded a significant interaction effect,  $F(1, 75) = 5.07$ ,  $p < .01$ . Postintervention differences between the two groups were only marginally significant in favor of the intervention group ( $p < .10$ ). However, follow-up assessments showed that intervention group children were rated lower on internalizing problems compared to control group children,  $t(75) = 3.04$ ,  $p < .01$ .

**Emotion recognition.** For the expressive component of emotion recognition, there was a significant interaction effect  $F(1, 75) = 3.21$ ,  $p < .05$ . Also, there were significantly more emotional displays correctly recognized by intervention group children compared to control group children,  $t(50) = 2.01$ ,  $p < .05$  ( $d = 0.45$ ). At follow-up, the group difference was only marginally significant in favor of the intervention group ( $p < .10$ ), showing that the intervention's effects were not maintained.

Control group (CON)								
Post		FU		ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests	
M	SD	M	SD		INT	CON	INT	CON
56.38	3.84	57.54	5.25	7.40**	7.14***	5.32***	9.16***	4.21**
112.00	18.18	117.46	16.32	4.17**	7.90***	4.82***	9.19***	4.30**
44.73	3.77	46.73	6.02	4.30*	6.22***	4.80***	10.53***	4.60**
70.19	11.12	74.85	11.34	7.10**	5.59***	1.71	7.52***	3.99**
69.08	8.37	71.65	7.46	3.97*	3.59*	1.43	4.09**	3.22**
0.61	0.30	0.68	0.30	3.56*	6.37***	2.81 <sup>†</sup>	7.92***	3.75**
0.07	0.11	0.02	0.07	2.33 <sup>†</sup>	-1.38	1.71	-2.42	-0.25
4.58	2.04	5.00	1.90	10.62***	7.63***	0.86	6.46***	1.52
5.85	2.13	6.62	1.68	2.54 <sup>†</sup>	4.60**	1.66	7.25***	3.32**

For the receptive task of emotion recognition, there was no significant interaction effect ( $p > .10$ ).

**Social problem-solving.** Group comparisons indicated that intervention group children used significantly more positive problem-solving strategies compared to control group children,  $t(50) = 3.34, p < .01$  ( $d = 0.75$ ). However, group differences were no longer significant at follow-up ( $p > .05$ ). The interaction effect was not significant for negative problem-solving strategies ( $p > .05$ ).

Means, standard deviations,  $F$  values for the interaction effect, pre-postintervention, and preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 5.

#### 4.3.1.4. Social competence – low risk group

**Social competence.** For teacher rated social competencies by SCS-T, we found a significant interaction effect  $F(1, 69) = 5.98, p < .01$ . In consequence, independent samples  $t$  tests confirmed that there were no significant postintervention changes in ratings of social competence in the intervention group compared to the control group ( $p > .05$ ). A somewhat similar pattern of findings was identified for the social competence ratings based on SCBE. There was a significant interaction effect  $F(1, 69) = 11.21, p < .001$ , but we found no significant differences between the intervention and control group ( $p > .05$ ). The data indicated that group differences in favor of the intervention group were present only at follow-up for SCS,  $t(69) = 3.00, p < .01$ , and also for SCBE,  $t(69) = 3.69, p < .001$ .

**Emotional competence.** Intervention group children were rated significantly better compared to control group children on the emotional competence measure,  $t(69) = 3.37, p < .05$  ( $d = 0.80$ ). The intervention's effects were maintained as intervention group children were rated significantly better compared to control group children,  $t(69) = 2.51, p < .05$ .

Table 5. Pre-, postintervention, and follow-up scores by group for low risk emotional competence children's classroom behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
ECS-T	51.07	4.54	52.97	4.17	53.52	4.62	49.65	3.29
SCS-T	63.05	5.25	66.24	6.41	66.69	5.65	62.71	7.33
SCBE Social Competence	131.60	29.22	142.98	20.75	152.24	21.03	131.20	29.73
SCBE Externalizing	74.33	13.90	80.76	8.08	85.88	8.17	71.85	11.85
SCBE Internalizing	73.45	10.42	77.57	8.17	80.86	5.65	70.77	8.89
AKT Expressive	3.95	2.05	5.69	1.35	6.19	1.52	4.26	2.16
AKT Receptive	5.95	2.05	6.95	1.78	6.95	1.78	6.24	1.25
Positive problem-solving	0.59	0.25	0.77	0.25	0.76	0.28	0.49	0.28
Negative problem-solving	0.03	0.08	0.01	0.04	0.00	0.00	0.04	0.09

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

**Externalizing problems.** Independent samples  $t$  test showed that intervention group children had significantly improved compared to control group children in terms of lower levels of aggression and non-compliance,  $t(69) = 2.16, p < .05 (d = 0.52)$ . Independent samples  $t$  test confirmed that only at follow-up intervention group children were rated significantly lower on externalizing problems,  $t(69) = 2.15, p < .05$ .

**Internalizing problems.** For teacher rated internalizing problems, we found a significant interaction effect  $F(1, 69) = 3.37, p < .05$ . However, immediately postintervention there were only marginally significant less internalizing problems in the intervention group compared to the control group ( $p < .10$ ). However, follow-up data showed that intervention group children were rated significantly lower on isolation and adult dependence compared to control group children  $t(69) = 2.47, p < .05$ .

**Social problem-solving.** There was a significant interaction effect for positive problem-solving strategies,  $F(1, 69) = 4.66, p < .05$ . Intervention group children used significantly more positive strategies than control group children,  $t(69) = 2.72, p < .05 (d = 0.65)$ . This trend was confirmed at follow-up by significantly more positive problem-solving strategies used by intervention group children compared to control group children,  $t(69) = 2.07, p < .05$ . Based on these data, the intervention maintained its effect on positive problem-solving strategies. Regarding the negative problem-solving strategies, we found no significant interaction effect ( $p > .05$ ).

**Emotion recognition.** For either expressive or receptive task, we found no significant interaction effects ( $p$ 's  $> .05$ ).

Means, standard deviations,  $F$  values for the interaction effect, pre-postintervention, and preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 6.



Control group (CON)								
Post		FU		ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests	
M	SD	M	SD		INT	CON	INT	CON
50.03	4.46	50.97	4.52	7.66**	2.88*	0.50	3.77**	1.69
63.26	6.67	62.66	7.06	4.76*	3.68***	0.87	3.93***	0.05
134.46	22.50	133.49	20.69	8.62**	5.03***	0.99	7.01***	0.52
76.20	12.46	81.11	11.42	4.97*	3.84**	2.12	7.21***	4.56***
74.17	6.71	76.69	6.38	5.07**	3.34**	2.90*	4.91***	4.10***
4.94	1.91	5.49	1.82	3.21*	4.57***	2.01	6.13***	3.17*
6.40	2.26	7.02	1.56	1.14	2.74 <sup>†</sup>	0.56	2.74 <sup>†</sup>	1.94
0.57	0.28	0.66	0.27	8.62**	4.51***	1.46	3.07*	2.88*
0.03	0.10	0.01	0.03	0.71	-1.69	-0.24	-2.67 <sup>†</sup>	-2.67 <sup>†</sup>

#### 4.3.1. Discussion for the moderate and low risk groups

The data discussed in the following section pertain to the intervention mechanisms we assumed for the universal intervention. Concerning our data from the moderate risk social competence risk group, as expected we found significant gains in social competencies as indicated by previous results (CPPRG, 1999b; Domitrovich et al., 2007), but also in terms of emotional development. The findings from the low risk groups indicate that there are no consistent gains in terms of emotional and social competencies development.

Data concerning children's ability to correctly name emotions indicated that children in the moderate risk group perform significantly better compared to the control group, as in previously reported universal interventions (Domitrovich et al., 2007). Also, this is the first universal intervention to report significant increases in positive problem-solving strategies as such measures were previously used for measuring the progress of high risk children (Webster-Stratton et al., 1998). As expected, we found no significant improvements regarding negative problem-solving strategies, since these were reported for clinically referred children (Webster-Stratton & Hammond, 1997).

Where the low risk group is concerned our findings detect inconsistent improvements in declarative knowledge suggesting that there might be a "ceiling" effect, which indicated that on medium-term low risk control group children are able to close the gap regarding declarative knowledge compared to the intervention group. Universal interventions have found that child-focused activities alone do not produce marked changes on aggressiveness and non-compliance (Domitrovich et al., 2007).

This argument is supported by the lack of positive effects for non-risk children found in most indicated (Kellam, Ling, Merisca, Brown, & Ialongo, 1998; van Lier et al., 2005), or selective prevention programs (Webster-Stratton et al., 2008). Unlike van Lier and colleagues (2005), our data suggest the contrary.

Table 6. Pre-, postintervention, and follow-up scores by group for low risk social competence children's classroom behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
SCS-T	64.05	5.01	66.46	6.13	66.66	5.43	64.00	6.71
SCBE Social Competence	137.74	25.82	146.87	20.57	154.74	20.10	139.28	24.56
ECS-T	50.97	4.90	52.97	3.90	53.72	4.22	49.75	3.56
SCBE Externalizing	75.36	14.29	80.95	8.09	86.28	8.13	73.72	8.81
SCBE Internalizing	73.77	10.77	78.21	8.69	80.64	6.20	72.00	7.56
Positive problem-solving	0.57	0.26	0.78	0.24	0.78	0.28	0.55	0.30
Negative problem-solving	0.03	0.08	0.01	0.04	0.01	0.03	0.03	0.07
AKT Expressive	4.08	1.90	5.46	1.55	6.08	1.44	3.97	2.15
AKT Receptive	5.97	2.06	6.97	1.77	7.38	1.13	5.81	2.46

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

Regarding the findings for the low risk groups, we note the fact that differences between the intervention and control groups on parent risk factors affected postintervention evaluations of externalizing problems. This effect is explained by studies which indicated that inadequate parenting practices are highly predictive of children's aggressive and non-compliant behaviors (Chang, Schwartz, Dodge, & McBride-Chang, 2003; Dennis, 2006), and in consequence the intervention did not exert effects on these behaviors. Regarding internalizing problems our data converge with previous findings from universal interventions suggesting that skill-building interventions result in positive effects on children's isolation (Domitrovich et al., 2007).

When emotional competencies were used as predictors of risk status significant gains in emotional competencies were not followed by improved social competencies in the moderate risk group, indicating that these results mirror those from the high risk group. However, significant social competence improvements were found at follow-up. This effect was no longer observable for the low risk group, for which we found improvements in both emotional and social competencies, indicating that a convergence of ratings occurs as a function of lower risk status.

Teacher-ratings in both moderate and low risk groups were supported by improvements in children's ability to name emotions and the increased use of positive problem-solving strategies. However, for the low risk groups this effect was no longer observable at follow-up, indicating that in fact control group children's declarative knowledge improve in time.

The results on externalizing problems mirrored those from the moderate social competence risk group, but there were no significant reductions in terms of internalizing problems. The explanation for this effect is that it seems that reduced isolation and avoidance of social interactions might be to a larger extent dependent on the intervention's effects on social skills (Mendez, Fantuzzo, & McDermott, 2002; Warnes, Sheridan, Geske, & Warnes, 2005).

Control group (CON)								
Post		FU		ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests	
M	SD	M	SD		INT	CON	INT	CON
64.13	6.37	62.19	7.06	5.98**	2.51 <sup>†</sup>	0.20	2.48 <sup>†</sup>	-1.82
138.38	19.30	136.78	20.79	11.21***	4.47***	-0.28	5.46***	-0.64
49.53	4.70	51.00	4.78	7.95**	3.03*	0.29	4.08**	1.45
76.28	11.53	82.16	7.95	4.44*	3.37**	1.40	6.26***	5.18***
74.69	6.37	76.94	6.39	4.37*	3.39**	2.51	4.74***	3.82**
0.61	0.28	0.66	0.27	4.66*	5.36***	1.72	3.68**	1.88
0.01	0.04	0.02	0.07	0.43	-1.71	-1.67	-1.93	-1.00
5.00	1.90	5.44	1.98	0.59	3.55**	3.01*	5.45**	3.68**
6.81	2.02	6.81	1.67	0.39	2.58 <sup>†</sup>	2.14	3.80**	2.21

## 5. GENERAL DISCUSSION

The results from this study represent the outcomes on children's classroom behaviors after implementing a multifocused prevention program, targeting two prevention levels: universal and indicated. Our data are also the first to obtain separate risk ratings for emotional and social competencies.

The first conclusion of this study is that the intervention's efficiency varies as a function of risk. Namely, the highest effect sizes were found for the high risk group, and these indices were usually in the moderate range for significant effects in the moderate and low risk groups. It is also interesting to note that our assumption that the most likely group to benefit from universal interventions are the moderate risk groups.

Another interesting finding is related to the independence of effects due to emotional and social competence development. It seems that while improvements in social competencies are associated with improved emotional competencies, improvements in emotional competencies are predictive of improved social competencies. One possible explanation is that deficient emotional competencies have a more damaging effect on children's ability to adapt to social interactions. Data from path analysis suggest that emotional competencies might be the fundamental for children's ability to exhibit socially acceptable behaviors (Roberts & Strayer, 1996). Also, previous studies have shown that the most consistent predictor of adequate social functioning is children's ability to regulate emotions (Eisenberg, Valiente, Morris, Fabes, Cumberland et al., 2003; Eisenberg, Fabes, Guthrie, & Reiser, 2000). Improvements in emotion regulation might take longer to exert effects on social behaviors, while improvements in social behaviors most likely cannot occur without improved emotional competencies.

Although we found consistent improvements in expressive emotion recognition, the lack of significant effects on receptive recognition is due to the fact that these abilities are targeted by different developmental mechanisms. Expressive emotion recognition is probably influenced by intentional learning processes such as talking about emotions, as opposed to receptive emotion recognition, which might rely less on explicit learning strategies. Moreover, some research

indicates that the expressive component is the proximal predictor of children's adequate use of emotion regulation strategies (Cole, Dennis, Smith-Simon, & Cohen, 2009).

Also, we wanted to estimate the direct contribution of skill development on externalizing and internalizing problems. Significant reductions in children's externalizing problems were found for the high risk groups, but the positive effects of the intervention were unexpected for the moderate risk groups. We believe that it might be a consequence of the fact that by the age of 5 all children irrespective of their risk status tend to exhibit significant reductions in aggressive and non-compliant behaviors (Hill, Degnan, Calkins, & Keane et al., 2006), but also related to the sensitivity of the measuring scale containing 6 rating points.

Our results would also suggest that lower levels of internalizing problems are associated to a larger extent with significant gains in social competencies, and that prevention programs targeting externalizing problems might be successfully used for preventing emotional problems. However, we feel compelled to draw attention on the fact that multiple risk factors, sometimes different from those predicting externalizing problems (Dadds & Roth, 2008), are involved in the pathogenesis of internalizing problems. It is also possible that a chronic internalizing problems pathway is more likely to occur in school aged children than in earlier developmental stages (Hay, Payne, & Chadwick, 2004), which would also sustain the interpretation of our findings.

## **Study 2. A COMPARATIVE STUDY ON THE EFFICACY OF A MULTIFOCUSED PREVENTION PROGRAM FOR CHILDREN'S EMOTIONAL AND SOCIAL COMPETENCIES DEVELOPMENT: EFFECTS ON CHILDREN'S BEHAVIORS AT HOME AND PARENTING PRACTICES**

### **1. INTRODUCTION**

The second study was based on the same rationale as the first study. We implemented a hybrid intervention model for the purposes of universal and selective intervention. We based this study on similar assumptions regarding the intervention's mechanisms, but we were interested in determining the efficacy of the intervention for children's behaviors at home and parent practices. For this study we used a similar two-stage screening method (Durlak & Wells, 1998).

### **2. OBJECTIVES**

In this study we report initial efficacy findings regarding the intervention's effects on children's behaviors at home and parent discipline strategies. The program's ability to exert changes in child and parent behavior at home was assessed as a function of risk. Screening measures were employed in order to identify three risk categories (high, moderate, low). Based on children's scores on the screening they were included in the indicated intervention level (high risk group), or the universal intervention level (moderate and low risk groups).

Second, we were interested in determining whether employing separate classification screening criteria would yield different intervention effects on children's and parental behaviors. Previous data from efficacy studies relied largely on questionnaires evaluating children's social competencies, and our hypotheses for social competence risk groups were built according to these data. In turn, for emotional competencies this study is exploratory.

According to previous research we expect to find significant changes for:

- all risk groups (universal + indicated intervention level) concerning higher ratings of parent assessed social competence, as well as better developed declarative knowledge in terms of emotion recognition, and positive problem-solving strategies (CPPRG, 1999a; 2002; Domitrovich et al., 2007)

- high risk children (indicated intervention) in terms of lower levels of parent rated externalizing problems (Brotman et al., 2005; Webster-Stratton, 1998), but not for non-risk children (Domitrovich et al., 2007); concomitantly we expect to find significantly less negative problem-solving strategies, although such findings were reported only for clinically referred children (Webster-Stratton & Hammond, 1997)
- parents of children in the high risk group (indicated intervention), in terms of lowered levels of harsh and/or inconsistent parenting strategies (CPPRG, 1999a; Webster-Stratton et al., 2001), and lowered levels of stress, as well as higher levels of appropriate discipline and positive parenting (Brotman et al., 2005).

### 3. METHOD

#### 3.1. Participants

A detailed description of the intervention and control groups are provided in Study 1.

#### 3.2. Design

We used a 2×3 quasi-experimental design with features described in Study 1.

#### 3.3. Intervention

The intervention was multifocused including classroom activities, teacher, and parent trainings, which were described in Study 1.

#### 3.5. Assessment

##### 3.5.1. Parent assessment of emotional and social competencies

**Screening.** In order to obtain risk evaluations we used two parent screening scales, namely *Emotion Competence Screening for Preschoolers – Parent Form* (ECS-P) and *Social Competence Screening for Preschoolers – Parent Form* (SCS-P; Miclea et al., 2010; Ştefan et al., 2009). The first scale contains 14 items assessing aspects related to emotion understanding, emotion expression, and emotion regulation (e.g., “The child recognizes that others feel happy, angry, sad, or afraid”, “The child shows patience until receiving attention or a reward”). The latter consists of 12 items assessing compliance to rules, interpersonal skills, and prosocial behavior (e.g., “The child cooperates with other children during play”; “The child shares his/her toys without being told”). The answers were coded on a 5-point Likert scale, where 1 = *almost never* and 5 = *almost always*. The ECS-P showed good internal consistency, Cronbach’s  $\alpha = .72-.79$ , and high ranging from .85 to .88 for the SCS-P, respectively.

**Social competence.** Children’s social skills were also assessed using the Social Competence scale from the *Social Skills Rating System - Preschool (Parent Form)* (SSRS; Gresham & Elliott, 1990). This summary scale is comprised of four 10-item subscales: Cooperation, Responsibility, Assertion, and Self-control (e.g., “Asks permission before using another family member property”, “Controls temper in conflict situations with you”). Each item is rated 3-point Likert scale, measuring the frequency of a specific behavior, where 0 = *never* and 2 = *very often*. Internal consistency coefficients for the summary scales were high and ranged from .85 to .88.

##### 3.5.2. Assessment of externalizing problems

**Externalizing problems** were rated by parents using the Behavior Problem summary scale from the SSRS (Gresham & Elliott, 1990). This scale is comprised from 10 items (e.g., “Argues with others”, “Disturbs ongoing activities”). The answers were rated on a 3-point Likert scale, where 0 = *never* and 2 = *very often*. Internal consistency coefficients for the summary scales varied between  $\alpha = .73 - .77$ , indicating good reliability. Since the norms for behavior problems were obtained on US samples, we derived cutoff points for our sample, using the split-half method. We obtained separate cut-offs for boys and girls, since independent samples *t* test revealed significant differences, with boys being rated significantly higher on behavior problems than girls ( $p < .01$ ).

### 3.5.3. Child direct assessment of emotion recognition and problem-solving

These measures were described in detail in Study 1.

### 3.5.4. Assessment of parent discipline strategies and parental stress

**Parenting practices.** We used a modified version of the original *LIFT Parenting Practices Interview* (PPI; Webster-Stratton et al., 2001) including only 5 out of the 7 initial scales. We ran a confirmatory factor analysis using a principal component analysis (PCA) to establish factor loadings. Items loading below .30 on a particular factor were dropped. The resulting scales were Harsh Discipline (e.g., “Slap or hit your child”), Inconsistent Discipline (e.g., “Threaten to punish him/her (but not really punish him/her)”), Appropriate Discipline (e.g., “Take away privileges (like TV, playing with friends)”), Positive Parenting (e.g., “I believe in using rewards to teach my child how to behave”), and Monitoring (e.g., “Children who are not supervised by an adult are more likely to develop behavior problems”). Each item was coded on a 7-point Likert scale, where 1 = *strongly disagree* and 7 = *strongly agree*. Cronbach’s  $\alpha$ s ranged between .68 and .82, except for the Monitoring scale,  $\alpha = .39$ . As a consequence this scale was dropped from our analysis due to its low internal consistency. Cut-off points for the Harsh and Inconsistent Discipline scales were computed using the split-half method.

**Parent stress.** *Parent Stress Index-Short Form* (PSI-SF, Abidin, 1995) evaluates parental stress and contains three basic scales comprised of 12 items each. The basic scales measure Parental Distress (e.g., “Since having a child I feel that I am almost never able to do things that I like to do”), Childrearing Stress (e.g., “My child seems to cry or fuss more often than most children”), and Difficult Child (e.g., “My child turned out to be more of a problem than I had expected”). Each item was scored on a 5-point Likert scale, where 1 = *strongly disagree* and 5 = *strongly agree*. The internal consistency was  $\alpha = .86-.91$ . The cut-off was obtained using the split-half method.

## 4. RESULTS AND DISCUSSION

### 4.1. Results and discussion for the indicated intervention level

#### 4.1.1. Results for the high risk groups

##### 4.1.1.1. Emotional competence

**Emotional competence.** ANOVA on parent rated emotional competence indicated a significant interaction effect ( $p < .001$ ). Intervention group children scored significantly higher than control group children,  $t(25) = 2.00$ ,  $p < .05$  ( $d = 0.85$ ). Analysis on follow-up scores showed that the intervention’s effects were maintained,  $t(25) = 2.16$ ,  $p < .05$ .

**Social competence.** For both SCS-P and SSRS measures of children’s social competencies we found no significant interaction effects ( $p$ ’s  $> .05$ ).

**Externalizing problems.** Parent ratings of externalizing problems yielded a significant time by group interaction effects ( $p < .01$ ). Following group comparisons confirmed that the intervention group was rated lower on externalizing problems, but this trend was only marginally significant ( $p < .10$ ). When the difference was computed only for children whose parents attended the intervention the difference was significant,  $t(20) = -2.49, p < .05$  ( $d = 0.99$ ). For those children whose parents attended the intervention the intervention's effects were maintained,  $t(20) = -2.36, p < .05$ .

**Emotion recognition.** Results indicated a significant interaction effect,  $F(1, 25) = 4.86, p < .05$ . Although immediately postintervention there was only a marginally significant difference in favor of the intervention group ( $p < .10$ ), this difference became significant at follow-up,  $t(25) = 2.57, p < .05$ . For receptive emotion recognition, we found no significant interaction effect ( $p > .05$ ).

**Social problem-solving.** ANOVA indicated a significant interaction effect for positive problem-solving strategies,  $F(1, 25) = 3.93, p < .05$ . Moreover, when compared to their control counterparts intervention group children used significantly more compliant, non-aggressive and prosocial strategies in solving the vignettes,  $t(25) = 2.15, p < .05$  ( $d = 0.80$ ). However, at follow-up the difference in favor of the intervention group was only marginally significant ( $p < .10$ ), indicating that the intervention did not maintain its effects. We found no significant interaction effect for negative problem-solving strategies ( $p > .05$ ).

**Parent behaviors.** We found significant interaction effects for inconsistent discipline strategies, appropriate discipline, and positive parenting ( $p < .05$ ). However, we only found significant within group effects, but no significant group differences. These results were maintained at follow-up.

Means, standard deviations,  $F$  values for the interaction effect, pre-postintervention, and preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 1.

#### 4.1.1.2. Social competence – high risk group

**Social competence.** Results for the screening instrument have indicated a significant time by group interaction effect,  $F(1, 26) = 5.04, p < .05$ . Subsequent analysis showed that the children in the intervention group improved significantly compared to the control group,  $t(26) = 2.21, p < .05$  ( $d = 0.85$ ). Also, we found significant differences in favor of the intervention group compared to the control group at follow-up,  $t(26) = 2.26, p < .05$ . Social competence ratings from SSRS showed similar results. Independent samples  $t$  test indicated that the intervention group improved significantly on parent rated social skills in comparison with the control group,  $t(26) = 2.01, p < .05$  ( $d = 0.77$ ). Follow-up analysis confirmed that the intervention's effect were maintained,  $t(26) = 2.10, p < .05$ .

**Emotional competence.** Mixed ANOVA indicated a significant interaction effect for parent rated emotional competence ( $p < .01$ ). There were no significant group differences ( $p > .05$ ).

**Externalizing problems.** Parents rated their children on behavioral problems. We found a significant interaction effect,  $F(1, 26) = 8.56, p < .01$ , followed by marginally significant fewer externalizing behaviors in the intervention group compared to the control group ( $p < .10$ ). When the difference was computed for children whose parent's attended the intervention, the intervention group scored significantly lower on this measure compared to control group children,  $t(18) = -2.04, p < .05$  ( $d = 0.93$ ). Based on follow-up results we found significantly less aggressive and non-compliant behaviors for these intervention group children,  $t(18) = -2.06, p < .05$ .

**Social problem-solving.** For positive problem-solving strategies, there was a significant interaction effect,  $F(1, 26) = 4.52, p < .05$ .

Table 1. Pre-, postintervention, and follow-up scores by group for high risk emotional competence children's behaviors at home and parent behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
ECS-P	43.06	2.17	50.06	3.60	52.25	2.67	43.82	2.27
SCS-P	39.64	5.59	44.44	4.16	46.38	4.77	40.18	5.72
SSRS Social Competence	45.50	10.01	52.94	6.60	55.19	5.60	46.82	6.87
SSRS Externalizing	5.68	1.14	3.44	1.52	2.63	1.15	5.36	1.43
AKT Expressive	2.31	2.15	5.31	1.45	5.62	1.45	3.27	2.24
AKT Receptive	4.38	2.45	6.25	2.05	6.75	1.61	4.45	3.33
Positive problem-solving	0.43	0.27	0.77	0.22	0.76	0.25	0.49	0.34
Negative problem-solving	0.05	0.09	0.01	0.05	0.00	0.00	0.05	0.09
<b>Parent behaviors</b>								
Harsh discipline	2.70	0.67	2.59	0.52	2.45	0.57	2.52	0.54
Inconsistent discipline	3.22	0.86	2.88	0.60	2.80	0.57	2.70	0.71
Parent stress	77.06	18.13	75.25	13.55	67.43	12.08	66.91	11.91
Appropriate discipline	4.49	0.66	4.84	0.67	4.86	0.69	4.91	0.44
Positive parenting	5.62	0.63	5.90	0.51	5.96	0.53	5.58	0.54

Note: ECS-P = Social Competence Screening-Parent; SCS-P = Emotion Competence Screening-Parent; SSRS = Social Skills Rating System.

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

Immediately postintervention positive problem solving strategies were employed significantly more frequently by intervention children compared to control group children,  $t(26) = 2.01$ ,  $p < .05$  ( $d = 0.75$ ). Follow-up differences were significant, showing that intervention group children used more positive problem-solving strategies compared to control group,  $t(26) = 2.18$ ,  $p < .05$ , indicating that the intervention's effects were maintained. We found no significant interaction effect for negative problem-solving strategies ( $p > .05$ ).

**Emotion recognition.** Mixed ANOVA showed a significant interaction effect for the expressive task of emotion recognition,  $F(1, 26) = 7.56$ ,  $p < .01$ . Group differences were established using ANCOVA, which indicated a significant intervention group effect,  $t(26) = 2.14$ ,  $p < .05$  ( $d = 0.55$ ). The group difference at follow-up was  $t(26) = 3.70$ ,  $p < .01$ , suggesting that the intervention's effect was maintained. There was no significant interaction effect for the receptive task ( $p > .05$ ).

**Parent behaviors.** We found significant interaction effects for inconsistent discipline strategies, appropriate discipline strategies, and positive parenting ( $p$ 's  $< .05$ ). Again, we only found significant within group improvements for the intervention group, effects which were maintained at follow-up, but no significant group differences ( $p$ 's  $> .05$ ).

Means, standard deviations,  $F$  values for the interaction effect, and pre-postintervention, and preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 2.



<b>Control group (CON)</b>									
<b>Post</b>		<b>FU</b>		<b>ANOVA F Time × Group</b>	<b>PRE vs. POST paired <i>t</i> tests</b>		<b>PRE vs. FU paired <i>t</i> tests</b>		
<b>M</b>	<b>SD</b>	<b>M</b>	<b>SD</b>		<b>INT</b>	<b>CON</b>	<b>INT</b>	<b>CON</b>	
47.36	2.73	49.73	2.97	9.32**	8.92***	6.89***	13.29***	8.86***	
44.27	5.14	45.45	5.84	0.72	5.44***	4.89**	7.60***	5.27**	
52.18	10.58	53.27	11.12	0.67	4.81**	2.01	4.92**	2.08	
4.36	1.63	3.64	1.69	5.05*	-8.54***	-5.24**	-9.91***	-3.54*	
4.27	1.27	4.55	1.37	4.86*	5.12***	1.80	6.65***	1.89	
5.36	2.01	5.64	2.34	0.92	2.85 <sup>†</sup>	1.03	3.58*	1.45	
0.56	0.30	0.60	0.18	3.93*	5.41***	0.61	5.53***	0.94	
0.04	0.08	0.02	0.06	0.20	-1.90	-0.55	-2.27	-1.50	
2.53	0.73	2.58	0.66	2.89 <sup>†</sup>	-1.07	0.11	-2.16	0.71	
2.83	0.97	2.78	0.84	7.20**	-3.10*	1.19	3.32*	0.78	
67.67	15.38	70.45	16.96	3.22 <sup>†</sup>	-1.52	0.22	-2.89 <sup>†</sup>	0.98	
4.94	0.57	4.94	0.50	4.94*	3.47*	0.36	4.07**	0.32	
5.61	0.41	5.60	0.37	3.64*	3.16*	0.27	3.37*	0.19	

#### 4.1.2. Discussion for the high risk groups

The data for the indicated intervention level showed that the social competence group findings largely resembled our predictions. Intervention group children were rated significantly better on social competence development, as indicated by previous prevention programs including parent trainings (CPPRG, 1999a). However, improvements in social competencies were not associated with improved ratings of emotional competence development. In spite of this effect, we found that intervention group children improved their ability to correctly name emotions, as well as using significantly more positive problem-solving strategies, indicating that some transfer of declarative knowledge has occurred. These results concur with previous ones from studies evaluating children's problem-solving in the context of children with diagnosed conduct problems (Webster-Stratton & Hammond, 1997), as well as children from low-income families (Webster-Stratton et al., 2008), but are the first reported for indicated interventions. No significant intervention effects were found for negative problem-solving strategies, probably because children participating in this study were not clinically referred (Webster-Stratton & Hammond, 1997; Webster-Stratton & Reid, 2003).

We also found significant reductions in externalizing problems, but significant group differences were only identified at follow-up.

Table 2. Pre-, postintervention, and follow-up scores by group for high risk social competence children's behaviors at home and parent behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
SCS-P	35.12	1.59	41.44	2.68	44.38	3.12	35.33	1.37
SSRS Social Competence	40.44	6.32	50.56	4.56	55.12	4.68	43.00	4.26
ECS-P	46.88	4.92	52.00	4.31	54.00	3.90	47.92	4.32
SSRS Externalizing	5.00	1.67	3.06	1.39	2.38	1.41	4.42	1.88
Positive problem-solving	0.38	0.31	0.68	0.22	0.79	0.30	0.44	0.29
Negative problem-solving	0.07	0.11	0.01	0.05	0.01	0.05	0.04	0.11
AKT	2.63	2.33	5.69	2.21	6.06	1.48	4.08	2.07
Expressive AKT	3.58	2.09	6.56	1.86	7.13	1.26	4.50	2.75
Receptive AKT								
<b>Parent behaviors</b>								
Harsh discipline	2.68	0.50	2.54	0.46	2.50	0.40	2.59	0.70
Inconsistent discipline	3.10	0.73	2.76	0.57	2.77	0.58	3.06	0.88
Parent stress	74.13	14.44	69.93	14.06	66.25	13.69	75.50	9.44
Appropriate discipline	4.24	0.75	4.76	0.73	4.78	0.70	4.61	0.80
Positive parenting	5.70	0.63	6.04	0.60	6.03	0.57	5.65	0.54

Note: SCS-P = Social Competence Screening-Parent; ECS-P = Emotion Competence Screening-Parent; SSRS = Social Skills Rating System.

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

Previous studies reported significant trends in terms of lower levels of externalizing problems for high risk children (Webster-Stratton, 1998; Webster-Stratton et al., 2001), but indicated that group differences are observable only for children whose parents attended the intervention. In turn, our results computed for this subgroup indicated similar results with those from the literature.

Contrary to our expectations, we did not find significant between group effects for parent behaviors. However, our results show significant within group effects for inconsistent parenting, appropriate discipline, and positive parenting. Data from the literature indicate inconsistent effects on harsh and/or inconsistent parenting strategies, especially for non-clinical samples (Brotman et al., 2005), and suggest that in some cases more consistent effects on positive discipline strategies are more likely to be observable.

On the other hand, for emotional competencies we found significant improvements in emotional competencies, but no effect on social competencies. Again, we find that social competence ratings are associated with trends in emotional development, while improved emotional competencies do not indicate similar trends for social competencies. However, regarding declarative knowledge we found that intervention group children were able to name more emotions and used significantly more positive problem-solving strategies. In terms of externalizing problems and parenting, the results mirrored those obtained for the social competence risk group.

Control group (CON)				ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests	
Post		FU			INT	CON	INT	CON
M	SD	M	SD					
39.25	2.45	41.50	3.61	5.04**	9.62***	6.18***	11.59***	6.53***
47.17	4.22	50.92	5.92	8.64***	8.60***	5.23**	6.51***	5.14**
50.08	5.63	53.25	5.31	3.51*	8.11***	2.03	8.91***	7.00***
4.08	1.44	3.75	1.60	8.56**	-5.91***	-1.17	-6.14***	-1.54
0.49	0.28	0.56	0.26	4.52*	4.50**	0.53	6.85***	1.10
0.06	0.11	0.03	0.08	2.51 <sup>†</sup>	-2.15	-1.00	-1.77	-1.00
4.42	2.39	4.33	1.61	7.56**	4.28***	0.62	5.62***	0.54
6.83	1.99	6.17	2.48	1.96	3.95**	3.14 <sup>†</sup>	5.89***	2.25
2.64	0.72	2.58	0.67	1.57	-1.52	0.49	-1.98	-0.12
3.14	0.99	3.15	0.85	5.97**	-3.07*	0.82	-3.35*	0.70
74.67	11.12	74.00	11.29	1.38	-1.31	-0.30	-2.54 <sup>†</sup>	-0.51
4.68	0.76	4.72	0.76	6.91**	4.77**	0.86	5.55***	0.92
5.69	0.43	5.69	0.42	3.19*	3.06*	0.49	2.95*	0.41

## 4.2. Results and discussion for the universal intervention level

### 4.2.1. Results for the moderate and low risk groups

#### 4.2.1.1. Emotional competence – moderate risk group

**Emotional competencies.** For the parent rated emotional competencies, mixed ANOVA yielded a significant interaction effect,  $F(1, 56) = 9.56, p < .001$ . Immediately postintervention, parents evaluated intervention group children significantly better compared to the control group children,  $t(56) = 2.39, p < .05$  ( $d = 0.63$ ). Analysis on follow-up scores, indicated that intervention group parents still rated their children as more emotionally competent than the control group,  $t(56) = 3.45, p < .01$ .

**Social competence.** ANOVA for SCS-P indicated a significant interaction effect,  $F(1, 56) = 4.60, p < .05$ . Although group differences were only marginally significant immediately after the intervention ( $p < .10$ ), at follow-up the difference became significant in favor of the intervention group,  $t(56) = 3.05, p < .01$ . Also, for the SSRS there was a significant interaction effect ( $p < .001$ ), and the group difference was significant favoring the intervention group,  $t(56) = 2.08, p < .05$  ( $d = 0.54$ ). However, the difference was only marginally significant at follow-up ( $p < .10$ ), suggesting that the intervention's effect was not maintained.

Table 3. Pre-, postintervention, and follow-up scores by group for moderate risk emotional competence children's behaviors at home and parent behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
ECS-P	50.06	1.57	55.18	2.57	57.09	3.09	50.76	1.36
SCS-P	40.41	4.67	45.66	3.44	47.63	3.38	40.50	43.77
SSRS Social Competence	46.00	6.68	53.34	4.92	55.53	6.12	48.15	6.79
SSRS Externalizing	4.12	1.76	2.67	1.47	1.94	1.12	4.32	1.86
Positive problem-solving	3.36	2.37	5.64	1.90	5.48	1.75	4.08	1.89
Negative problem-solving	4.75	1.97	6.61	1.75	6.73	1.64	5.81	2.35
AKT	0.51	0.29	0.77	0.21	0.80	0.22	0.50	0.24
Expressive AKT	0.05	0.11	0.01	0.05	0.00	0.00	0.04	0.09
Receptive AKT								
<b>Parent behaviors</b>								
Harsh discipline	2.50	0.54	2.35	0.48	2.31	0.40	2.69	0.87
Inconsistent discipline	2.95	0.85	2.70	0.80	2.65	0.69	3.00	0.87
Parent stress	67.25	14.78	62.31	13.46	61.59	13.07	72.62	18.83
Appropriate discipline	4.42	0.81	4.80	0.68	4.81	0.51	4.46	0.93
Positive parenting	5.45	0.69	5.74	0.59	5.78	0.56	5.55	0.65

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

**Externalizing problems.** There was a time by group interaction effect,  $F(1, 56) = 4.97, p < .05$  as well as a significant reduction in aggression, non-compliance and anger tantrums for intervention group children compared to control group children,  $t(56) = -2.98, p < .01$  ( $d = 0.78$ ). At follow-up, intervention group children were rated significantly lower on externalizing problems compared to the control group,  $t(56) = -3.97, p < .01$ .

**Emotion recognition.** Regarding children's ability to name emotions, there was a significant time by group interaction,  $F(1, 56) = 3.80, p < .05$ . As expected, intervention group children named significantly more emotions correctly compared to control group children,  $t(56) = 2.09, p < .05$  ( $d = 0.41$ ). The intervention's effect was not maintained, the difference between the intervention and control group was only marginally significant ( $p < .10$ ). No significant interaction effect was found for the receptive task ( $p > .05$ ).

**Social problem-solving.** ANOVA yielded a significant interaction effect,  $F(1, 56) = 3.90, p < .05$ . Intervention group children used significantly more positive problem-solving strategies than control group children,  $t(56) = 2.49, p < .05$  ( $d = 0.68$ ). However, at follow-up the group difference was only marginally significant in favor of the intervention group ( $p < .10$ ), which showed that the intervention did not maintain its effects. Mixed ANOVA showed no significant interaction effect for negative problem-solving strategies ( $p > .05$ ).

**Parent behaviors.** There was a significant interaction effect for inconsistent parenting, parent stress, appropriate discipline, and positive parenting ( $p$ 's  $< .05$ ). For all variables we found significant within group progress, but no significant group differences ( $p$ 's  $> .05$ ).

Control group (CON)				ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests	
Post		FU			INT	CON	INT	CON
M	SD	M	SD					
53.40	3.09	54.36	2.87	9.56***	10.85***	4.16**	12.12***	5.35***
43.77	4.19	44.85	3.54	4.60*	7.99***	6.97***	9.35***	4.93***
50.54	5.35	52.42	6.31	10.27***	9.18***	2.93 <sup>†</sup>	8.51***	3.73**
3.88	1.61	3.28	1.46	4.97**	-5.64***	-1.31	-6.86***	-3.38**
4.80	2.18	4.76	1.76	3.80*	4.57***	1.60	4.13**	1.67
6.72	2.09	7.00	1.55	2.17	4.54***	2.21	4.68***	1.88
0.59	0.31	0.67	0.28	3.90*	4.98***	1.67	5.04***	3.22*
0.06	0.11	0.02	0.07	2.27	-2.05	0.65	-2.89 <sup>†</sup>	-1.05
2.69	0.79	2.70	0.84	2.49 <sup>†</sup>	-2.12	0.02	-2.46 <sup>†</sup>	0.23
3.03	0.86	2.98	0.86	3.83*	-3.49**	0.49	2.75*	0.14
69.15	17.19	66.08	15.65	3.49*	-4.00**	-2.41	-3.12*	-2.75 <sup>†</sup>
4.52	0.83	4.57	0.75	3.51*	3.44**	0.83	3.37**	1.17
5.51	0.61	5.54	0.59	3.96*	3.34**	-0.03	4.43***	-0.20

At follow-up, all differences were not significant, except for parent stress, intervention group parents reporting significantly less stress than control group parents,  $t(56) = -2.14$ ,  $p < .05$ .

Means, standard deviations,  $F$  values for the interaction effect, pre-postintervention, preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 3.

#### 4.2.1.2. Social competence – moderate risk group

**Social competence.** For SCS-P parent ratings, there was a significant time by group interaction effect,  $F(1, 52) = 5.64$ ,  $p < .05$ . Independent samples  $t$  test on postintervention scores confirmed that the intervention group had significantly improved in social skills compared to the control group,  $t(52) = 2.60$ ,  $p < .05$  ( $d = 0.76$ ). Significant differences in social competence scores between the two groups at follow-up,  $t(52) = 2.07$ ,  $p < .05$ , indicated that the intervention maintained its effects. ANOVA for SSRS parent ratings of social competence, showed a significant interaction effect,  $F(1, 52) = 12.08$ ,  $p < .001$ . Independent samples  $t$  test on posttest scores showed that intervention group children were rated significantly higher on social competence compared to children from the control group,  $t(52) = 2.04$ ,  $p < .05$  ( $d = 0.57$ ). Following  $t$  tests confirmed that the intervention's effects were maintained,  $t(52) = 2.51$ ,  $p < .05$ .

Table 4. Pre-, postintervention, and follow-up scores by group for moderate risk social competence children's behaviors at home and parent behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
SCS-P	40.40	1.25	46.37	2.67	47.83	2.73	41.00	1.38
SSRS Social Competence	46.16	5.21	53.47	5.28	55.43	5.83	48.37	4.82
ECS-P	50.10	4.14	54.97	3.30	57.33	3.19	51.79	5.02
SSRS Externalizing	4.26	1.70	2.76	1.40	2.06	1.41	4.08	1.72
Positive problem-solving	0.53	0.28	0.74	0.25	0.78	0.22	0.47	0.26
Negative problem-solving	0.06	0.10	0.01	0.05	0.01	0.04	0.03	0.07
AKT Expressive	3.73	2.02	5.60	1.67	6.07	1.44	3.79	2.17
AKT Receptive	5.93	2.20	6.73	1.60	6.97	1.35	5.50	2.78
<b>Parent behaviors</b>								
Harsh discipline	2.35	0.61	2.26	0.49	2.14	0.45	2.64	0.91
Inconsistent discipline	2.87	0.84	2.64	0.83	2.57	0.72	2.89	0.83
Parent stress	67.97	18.14	62.00	14.80	60.33	13.35	70.83	18.62
Appropriate discipline	4.49	0.73	4.68	0.60	4.73	0.43	4.29	0.65
Positive parenting	5.50	0.65	5.77	0.53	5.86	0.52	5.52	0.64

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

**Emotional competence.** We found a significant interaction effect for parent rated emotional competence,  $F(1, 52) = 10.88, p < .05$ . Immediately after the intervention there was no significant group difference ( $p > .05$ ), but the difference was significant at follow-up in favor of the intervention group,  $t(52) = 3.05, p < .01$ .

**Externalizing problems.** Mixed ANOVA indicated no significant interaction effect for children's externalizing problems ( $p > .05$ ).

**Social problem-solving.** We also found a significant interaction effect for positive problem-solving ( $p < .05$ ), and intervention group children used significantly more positive problem-solving strategies than control group children,  $t(52) = 2.04, p < .05$  ( $d = 0.55$ ), while at follow-up differences were only marginally significant in favor of intervention group children ( $p < .10$ ). No significant interaction effect was found for negative problem-solving strategies ( $p > .05$ ).

**Emotion recognition.** There was a significant time by group interaction effect for the expressive task of emotion recognition ( $p < .05$ ). Group comparisons indicated that intervention group children name correctly significantly more emotions compared with control group children,  $t(52) = 2.74, p < .01$  ( $d = 0.75$ ). At follow-up, intervention group children recognized significantly more emotions than control group children  $t(52) = 3.33, p < .01$ , indicating that the intervention's effects were maintained. There was no significant interaction effect for the receptive task ( $p > .05$ ).

**Parent behaviors.** Mixed ANOVA's yielded significant interaction effects for parent stress and positive parenting ( $p$ 's  $< .05$ ).

Control group (CON)				ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests	
Post		FU			INT	CON	INT	CON
M	SD	M	SD					
44.54	2.43	46.08	3.75	5.64**	11.20***	6.93***	16.09***	5.86***
50.79	4.09	51.79	4.55	12.08***	7.69***	3.13*	9.06***	3.41**
53.75	4.01	54.42	3.49	10.88***	6.72***	3.12*	10.42***	2.97 <sup>†</sup>
3.29	1.55	2.63	1.38	2.14 <sup>†</sup>	-7.43***	-2.44 <sup>†</sup>	-6.53***	-4.74***
0.57	0.36	0.66	0.27	3.70*	4.10**	1.64	4.05**	3.79**
0.07	0.18	0.03	0.07	2.81 <sup>†</sup>	-2.83 <sup>†</sup>	0.75	-3.22*	0.70
4.29	1.83	4.54	1.93	4.28*	4.00***	1.10	5.17***	1.59
6.67	1.95	6.88	1.65	0.20	1.99	1.97	2.34 <sup>†</sup>	2.36 <sup>†</sup>
2.62	0.90	2.64	0.90	1.74	-1.09	-0.60	-2.42 <sup>†</sup>	-0.29
2.93	0.83	2.80	0.82	2.53 <sup>†</sup>	-2.95 <sup>†</sup>	0.61	-2.69 <sup>†</sup>	-1.19
70.71	19.95	71.46	15.09	4.77*	-3.56**	-0.05	-3.83**	1.65
4.43	0.68	4.50	0.57	0.08	2.31 <sup>†</sup>	1.84	2.21 <sup>†</sup>	2.56 <sup>†</sup>
5.47	0.66	5.50	0.61	7.04**	4.03**	-0.34	5.63***	-0.21

Pairwise comparisons showed significant pre-postintervention improvements for intervention group parents, but group differences were only marginally significant ( $p$ 's < .10). Follow-up comparisons showed that intervention group parents reported significantly less parenting stress compared to control group parents,  $t(52) = 2.87$ ,  $p < .01$ , and significantly more consistent use of praise and rewards for intervention group parents compared to control group parents,  $t(52) = 2.34$ ,  $p < .05$ .

Means, standard deviations,  $F$  values for the interaction effect, pre-postintervention, and preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 4.

#### 4.2.1.3. Emotional competence – low risk group

**Emotional competence.** Significant time by group interaction effects were found for parent rated emotional competencies ( $p < .01$ ). Because significant preintervention differences were found for parent rated emotional competencies, we used ANCOVA entering pretest data as covariates in order to determine possible group differences. There was no significant group effect on postintervention results for emotion competence ratings ( $p > .05$ ). Following  $t$  tests showed significantly higher emotional competence ratings for intervention group children compared to control group children,  $t(72) = 2.69$ ,  $p < .01$ .

Table 5. Pre-, postintervention, and follow-up scores by group for low risk emotional competence children's behaviors at home and parent behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
ECS-P	56.80	2.89	57.90	3.87	59.82	3.23	58.28	3.59
SCS-P	47.05	5.11	50.17	4.54	50.46	4.23	48.06	5.41
SSRS Social Competence	53.95	7.28	57.93	7.23	60.20	7.51	56.09	7.74
SSRS Externalizing	2.60	1.85	1.80	1.47	1.24	1.22	1.91	1.38
Positive problem-solving	3.92	1.78	5.90	1.54	6.17	1.55	4.19	2.18
Negative problem-solving	5.90	2.22	7.12	1.42	7.38	1.47	5.47	2.53
AKT Expressive	0.52	0.27	0.80	0.26	0.82	0.24	0.47	0.30
AKT Receptive	0.02	0.07	0.01	0.03	0.00	0.00	0.04	0.09
<b>Parent behaviors</b>								
Harsh discipline	2.34	0.64	2.31	0.55	2.18	0.58	2.26	0.65
Inconsistent discipline	2.55	0.85	2.45	0.73	2.45	0.66	2.85	0.89
Parent stress	60.27	13.84	58.41	10.55	56.93	10.41	59.28	13.03
Appropriate discipline	4.52	0.81	4.76	0.74	4.89	0.67	4.62	0.82
Positive parenting	5.73	0.51	5.90	0.40	5.95	0.36	5.58	0.67

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

**Social competence.** Mixed ANOVA's showed a significant time by group interaction effect for both SCS and SSRS parent rated competencies ( $p$ 's  $> .05$ ). However, there were no significant group differences immediately after the intervention, as well as no significant improvements at follow-up ( $p$ 's  $> .05$ ).

**Externalizing problems.** There was a significant time by group interaction effect  $F(1, 71) = 7.14, p < .01$ . Independent samples  $t$  test, showed that there were no significant group differences regarding externalizing problems both postintervention and at follow-up ( $p$ 's  $> .05$ ).

**Emotion recognition.** We found a significant interaction effect for the expressive task ( $p < .05$ ). Also, the intervention group performed significantly better on this task compared to control group children,  $t(71) = 2.14, p < .05$  ( $d = 0.47$ ), but the group difference was no longer significant at follow-up ( $p > .05$ ). No significant interaction effect for the receptive task ( $p > .05$ ).

**Social problem-solving.** There was a significant interaction effect for positive problem-solving,  $F(1, 71) = 4.75, p < .05$ . Intervention group children were rated significantly better compared to control group children,  $t(71) = 2.79, p < .01$  ( $d = 0.65$ ). However, at follow-up the group difference was only marginally significant in favor of the intervention group ( $p < .10$ ), indicating that the intervention did not maintain its effects.

**Parent behaviors.** Mixed ANOVA on parent self-ratings yielded a significant interaction effect for appropriate discipline strategies,  $F(1, 71) = 4.57, p < .05$ . Independent samples  $t$  tests showed that there were no significant group differences immediately postintervention ( $p > .05$ ). We also found a significant interaction effect for positive parenting,  $F(1, 71) = 4.11, p < .05$ .



Control group (CON)									
Post		FU		ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests		
M	SD	M	SD		INT	CON	INT	CON	
58.03	4.09	58.72	3.87	6.05**	2.36 <sup>†</sup>	-0.38	7.98***	0.65	
48.78	4.48	50.72	3.62	3.22*	5.26***	1.18	5.19***	2.76 <sup>†</sup>	
57.00	8.02	57.88	6.60	3.58*	3.42**	0.89	4.49***	1.57	
1.78	1.52	1.63	1.10	7.14**	-3.85**	-2.19	-7.20***	-5.80***	
5.03	2.10	5.78	1.90	3.67*	5.74***	1.87	6.36***	3.10*	
6.28	2.08	7.06	1.44	0.72	4.68***	1.87	4.35***	3.72**	
0.63	0.26	0.71	0.27	4.75*	6.79***	3.64**	5.73***	4.07**	
0.03	0.08	0.03	0.08	0.27	-2.22	-1.00	-2.40 <sup>†</sup>	-0.81	
2.26	0.67	2.36	0.63	2.84 <sup>†</sup>	-0.56	0.05	-2.34 <sup>†</sup>	1.04	
2.88	0.79	2.78	0.79	1.00	-1.65	0.33	-1.39	-0.65	
59.56	16.60	61.81	15.46	2.44 <sup>†</sup>	-0.29	0.12	-2.06	0.91	
4.62	0.84	4.69	0.80	4.57*	4.24***	0.01	5.00***	0.65	
5.62	0.65	5.65	0.63	4.11*	3.04*	0.44	4.42***	1.10	

Immediately postintervention we found significant differences between the intervention and control group,  $t(71) = 2.13$ ,  $p < .05$  ( $d = 0.52$ ). However, neither group difference was significant at follow-up ( $p$ 's  $> .05$ ).

Means, standard deviations,  $F$  values for the interaction effect, pre-postintervention, and preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 5.

#### 4.2.1.4. Social competence – low risk group

**Social competence.** No significant interaction effects were found for parent rated social competencies ( $p$ 's  $> .05$ ).

**Emotional competence.** There was a significant interaction effect for parent rated emotional competencies,  $F(1, 74) = 4.14$ ,  $p < .01$ . Group comparisons showed there were no significant differences immediately after the intervention, as well as at follow-up ( $p$ 's  $> .05$ ).

**Externalizing problems.** There was no significant time by group interaction effect ( $p > .05$ ).

**Social problem-solving.** ANOVA's yielded no significant interaction effects ( $p > .05$ ).

**Emotion recognition.** For the expressive component of emotion recognition there was a significant interaction effect,  $F(1, 74) = 7.25$ ,  $p < .01$ . Intervention group children were able to name correctly significantly more emotional displays compared to control group children,  $t(74) = 2.42$ ,  $p < .05$  ( $d = 0.51$ ).

Table 6. Pre-, postintervention, and follow-up scores by group for low risk social competence children's behaviors at home and parent behaviors

Child behaviors	Intervention group (INT)							
	Pre		Post		FU		Pre	
	M	SD	M	SD	M	SD	M	SD
SCS-P	48.44	4.08	50.58	3.94	50.86	3.96	49.39	4.27
SSRS Social Competence	55.70	6.63	58.56	6.78	60.19	7.71	57.42	7.35
ECS-P	54.95	5.00	57.09	4.19	59.28	4.84	56.03	5.62
SSRS Externalizing	2.26	1.76	1.58	1.40	1.40	1.15	1.85	1.33
Positive problem-solving	0.53	0.26	0.76	0.27	0.78	0.26	0.55	0.29
Negative problem-solving	0.01	0.05	0.01	0.04	0.01	0.03	0.03	0.07
AKT Expressive	3.44	1.99	5.84	1.48	6.14	1.44	4.27	2.07
AKT Receptive	5.12	2.14	6.37	1.48	7.33	1.25	5.76	2.42
<b>Parent behaviors</b>								
Harsh discipline	2.46	0.65	2.40	0.56	2.29	0.59	2.46	0.65
Inconsistent discipline	2.67	0.94	2.54	0.75	2.54	0.67	2.81	0.87
Parent stress	61.19	13.69	59.67	10.32	58.47	10.31	58.45	11.79
Appropriate discipline	4.56	0.82	4.87	0.76	4.95	0.70	4.83	0.89
Positive parenting	5.66	0.55	5.84	0.42	5.87	0.41	5.55	0.68

\*  $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$  †  $p < .10$  statistically marginal effect

However, group differences at follow-up were no longer significant ( $p > .05$ ), indicating that the intervention did not maintain its effects.

**Parent behaviors.** For appropriate discipline we found a significant interaction effect,  $F(1, 74) = 9.96, p < .001$ . However, the group difference was not significant neither postintervention, nor at follow-up ( $p$ 's  $> .05$ ). Mixed ANOVA yielded a significant time by group interaction effects for positive parenting,  $F(1, 74) = 3.37, p < .05$ . Following independent samples  $t$  test showed that group differences were only marginally significant ( $p < .10$ ), and became significant at follow-up,  $t(74) = 2.01, p < .05$ .

Means, standard deviations,  $F$  values for the interaction effect, pre-postintervention, and preintervention-follow-up paired samples  $t$  test values within each group can be found in Table 6.

#### 4.2.2. Discussion for the moderate and low risk groups

The data for the moderate risk group derived based on social competencies screening indicated that children were rated significantly higher by their parents on measures of social skills, which has been previously reported in a universal intervention which did not include parent training (Domitrovich et al., 2007). However, separate ratings of emotional competence indicated that these were significantly improved only at follow-up. However, data from the experimental tasks suggest that children significantly improved in terms of improving their ability to name emotions, and to offer positive solutions to hypothetical conflict situations.

Control group (CON)								
Post		FU		ANOVA F Time × Group	PRE vs. POST paired <i>t</i> tests		PRE vs. FU paired <i>t</i> tests	
M	SD	M	SD		INT	CON	INT	CON
49.19	3.58	51.21	2.90	1.71	3.79**	0.97	3.70**	2.27 <sup>†</sup>
58.70	8.45	60.61	7.70	0.51	2.81 <sup>†</sup>	0.96	3.48**	2.36 <sup>†</sup>
56.91	4.53	57.70	4.68	4.14*	3.80**	1.29	7.09***	2.20
1.64	1.43	1.48	1.18	1.54	-3.21**	-0.82	-3.63**	-1.44
0.66	0.24	0.71	0.25	1.87	6.13***	1.83	6.60***	2.89 <sup>†</sup>
0.05	0.11	0.02	0.07	0.72	-0.50	-0.80	1.00	-0.50
4.97	1.90	5.64	1.64	7.25**	6.82***	2.07	7.82***	3.26**
5.85	2.40	6.88	1.54	2.57	4.01**	0.20	6.01***	2.62 <sup>†</sup>
2.29	0.60	2.42	0.61	3.14 <sup>†</sup>	-1.23	-0.19	-2.51 <sup>†</sup>	1.63
2.86	0.79	2.80	0.82	1.80	-2.11	0.62	-1.80	-0.67
56.67	12.06	59.03	14.02	1.37	-1.16	-1.01	-1.75	0.22
4.76	0.89	4.80	0.84	9.96***	4.13***	0.71	5.54***	0.34
5.61	0.59	5.65	0.59	3.37*	3.29***	0.78	4.21***	1.29

These measurements also provide the first empirical data establishing a possible effect of parent training on children's declarative knowledge in the context of a non-clinical sample. Consistent with our expectations we found that parents of children from the moderate risk group, were more likely to develop positive discipline strategies and improvements in the use of rewards (Brotman et al., 2005), mainly due to the fact that these children do not exhibit high levels of misbehaviors more consistently associated with inappropriate parenting practices (Bradley & Corwyn, 2007; Snyder et al., 2005).

For low risk children and parents we found no significant improvements on any of the measured variables, which is consistent with the fact that the lowest percentage of parent attendance was found for this group (30%), thus minimizing the possibility to detect a transfer of skills.

When emotional competencies were used as predictors, we found significant improvements for parent rated emotional competencies, as well as social competencies. Unlike the teacher ratings it seems that there is a higher convergence of parent ratings in the moderate risk group which might be a consequence of the fact that both high and moderate risk parents had similar, high attendance rates (55-65%). Moreover, for this group we found two unexpected effects: first, a significant intervention effect on children's externalizing problems, and a trend for inconsistent parenting. Our interpretation is that parent ratings of emotional competence might be more informative of children's problems, since lack of patience, anger outbursts are more easily observed by parents, and they are thus motivated to find and implement solutions

for this types of problems. On the other hand, social skills require them to observe their children's behaviors in relation to other children, and in turn it might be more difficult to adequately evaluate them. However, another equally plausible explanation is that this effect might be an artifact, and future studies will need to confirm the presence of such an effect.

For the low risk emotional competence group we found some initial improvements in children's declarative knowledge, but these effects were no longer observable at follow-up due to a "ceiling" effect.

## 5. GENERAL DISCUSSION

This study was aimed at testing the intervention's effects on children's behaviors at home, as well as changes in parenting practices. Where competence ratings are concerned the independent effects for emotional and social competencies are largely detected in the high risk group, and show a convergence in the case of low risk groups. Also, this study is the first to report empirical evidence from a multifocused intervention including parent training on the transfer of children's declarative knowledge. Such evidence was previously reported for clinically referred children (Webster-Stratton & Hammond, 1997; Webster-Stratton et al., 2004). The most consistent progress in terms of competencies development was found for the moderate risk group, indicating that parents detect more easily progress for children who exhibit marginally at risk problems, since their potential of significant changes in behaviors in a shorter amount of time is greater. Empirical evidence suggests the notion that the time and amount of practice needed in order to detect improvements in children's behaviors varies as a function of symptom severity (Stoolmiller et al., 2000).

For parenting practices contrary to our expectations, we did not find any changes in relation to harsh parenting, which is considered the most robust predictor of children's behavior problems (Bradley & Corwyn, 2007; Snyder et al., 2005). Since harsh parenting is highly associated with parental psychopathology, low SES, and child diagnosed behavior problems (Chronis, Lahey, Pelham, Hall Williams, Baumann et al., 2007; Curtner-Smith et al., 2006; Gutermuth Anthony, Anthony, Glanville, Naiman, Waandres et al, 2005), and our sample included only small percentages of parents and children corresponding to this profile, the lack of significant changes might be a result of the fact that the cut-off score is lower than those established for samples with more diverse risk factors. Also, the presence of within group trends for inconsistent parenting might be explained by the fact that high risk groups included high percentages of boys and in normative samples parents tend to be more inconsistent in their disciplining strategies in relation to boys (Kim, Arnold, Fisher, & Zeljo, 2005). And third, some changes in parental attitudes might have occurred, but their perceptions could be influenced by the amount of time they spend with their children. More precisely, limited amount of interactions with their children might not provide them with opportunities to implement new skills and detect changes in parental behaviors. Studies indicated that parental involvement in terms of play time, special parent-child activities, and emotional availability, have a positive impact on children's development (Snyder, 2007).

## 6. CONCLUSIONS

Data from Studies 1 and 2 represent the first steps towards validating a multifocused prevention program for preschoolers in Romania. This approach included a hybrid intervention model for which we assumed different mechanisms of changes for each prevention level: universal and indicated. Taking into account the criteria established by Chambless & Hollon (1998), this program might be considered as *promising*, as further studies should replicate the intervention's effects.

Future studies should include an extended sample both in terms of more classrooms and more diverse SES backgrounds. In our studies statistical analyses were conducted at the individual, child level, although the randomization unit was the classroom. Due to the relatively small number of classrooms selected, multi-level statistical models could not be used (Webster-Stratton et al., 2008). Non-independence of participants resulted from clustering within classrooms might bias the results due to the fact that results might vary depending on shared environmental characteristics (Stoolmiller et al., 2000). Also, as discussed in the previous section, more diverse samples in terms of demographic characteristics would be helpful for making inferences on a larger category of children and parents.

Future studies should also address effectiveness issues, mainly due to the fact that the limited number of participants made possible consistent monitoring and support provided for implementing the program to the established standards. The quality of program delivery, with teachers reporting high levels of integrity in all classrooms (more than 90% of the activities) would largely account for the consistent intervention effects on children's classroom behaviors. Effectiveness studies will need to confirm whether similar results would be obtained in more ecological contexts with less support than provided in this study.

However, we note that teachers were also directly responsible of implementing and evaluating the outcomes of the intervention. Due to this fact we cannot rule out the fact that their evaluations are biased due self-fulfilling prophecies which might have lead to overestimating the intervention's effects. Since the best predictors of future adjustment and low risk for conduct problems are observations during play sessions, especially for high risk children (Patterson & Forgatch, 1995), we would support the use of such measures in future efficacy testing studies especially for this risk category. However, knowing that teacher ratings have the strongest positive association with independent observations of children's play patterns (Hinshaw, Han, Erhardt, & Huber, 1992), we would be tempted to believe that such a method should provide similar results, although not necessarily confirmatory of our findings. Where parents are concerned, the use of observation methods is less likely, mostly because of the invasive nature of the procedure, which is more consistently used for clinically-referred children (Webster-Stratton & Hammond, 1997).

We note that another limitation of this study is the fact that we did not evaluate directly the effect of training on teacher's behaviors in the classroom. Due to the small sample size of teachers participating in this study, no reliability or validity analysis could be conducted.

As indicated we assumed different mechanisms of the intervention as responsible for the observed effects on behaviors for the universal and indicated prevention. However, we cannot establish which components of the intervention were responsible for the intervention's efficacy. Future studies comparing child-focused training, parent training, and a combination of the two, should provide added information about the extent to which they exert changes on targeted behaviors (Webster-Stratton & Hammond, 1997; Webster-Stratton & Reid, 2003).

### **Chapter 3. AN IDIOGRAPHIC APPROACH TO EVIDENCE-BASED PREVENTION PROGRAMS**

#### **Study 3. CHANGES IN OBSERVED CLASSROOM BEHAVIORS FOR PRESCHOOLERS AT RISK FOR BEHAVIOR PROBLEMS: A MULTIPLE BASELINE EVALUATION**

##### **1. INTRODUCTION**

Most of the researchers testing the efficacy of intervention programs are more interested in determining the extent to which these programs have the desired effects on targeted behaviors by comparing assessments at different time points between intervention and control groups

(Morgan & Morgan, 2008). While this approach has been dominant in the framework of evidence-based interventions, the use of single-subject designs has been more widely used in testing interventions for clinically referred children such as conduct disorders, ADHD, autism, etc. (Gmeider & Kratochwill, 1998; Fenstermacher, Olympia, & Sheridan, 2006; Loftin, Odom, & Lantz, 2008). Although much of what we know about the efficacy of some intervention methods is a direct consequence of these studies, less is known about how those similar methods are relevant for children at risk for conduct disorders.

Recent approaches to evaluating the intervention's effects in single-case studies call for the need to carefully select participants based on similar demographic and risk factors in order to ensure a more accurate estimation of the intervention's effects (Conoley, Graham, Neu, Craig, O'Pry et al., 2003). Taking into consideration developmental models establishing the pathogenesis of conduct disorders it is interesting to note that children's risk is enhanced by interactions with parental, as well as educational environment risk factors (Ştefan & Miclea, 2010; Webster-Stratton & Taylor, 2001). The primary risk source is constituted by deficient competencies, which in turn lead to more frequent displays of aggressive and non-compliant behaviors (Denham et al., 2001; 2002). There is a wide range of empirical evidence supporting the notion that children's maladaptive behaviors are maintained by poor parenting skills (Frick, Lahey, Loeber, & Stothamer-Loeber, 1992; Nicholson et al., 2005). In consequence, in this study we treated the presence of additional parent risk, as an exclusion criterion.

## **2. OBJECTIVES**

The first objective of this study was to evaluate the intervention's effects on high risk children's classroom behaviors regarding four targeted behaviors: compliance to rules, frustration tolerance, prosocial skills, and cooperative play.

The second objective was to determine to which extent the intervention produced effects immediately after the intervention took place, or whether these effects were delayed to the maintenance phase. Because this type of intervention does not provide individualized training it is possible that the actual effects might be more difficult to observe immediately postintervention as in the case of clinical studies. Also, since the intervention targets complex social behaviors, which need extended teaching and practice, significant changes might take longer to occur (Lewis & Sugai, 1999).

Due to the fact that some of the constructs assessed in this intervention are not independent, there is a strong possibility of carry-over effects. For example, changes in rule compliance and emotion regulation might lead to improved prosocial skills (Eisenberg et al., 1999), and the development of prosocial skills might trigger the development of cooperative play strategies (Sheridan, Hungelman, & Maughn, 1999). In consequence, we attempted to establish whether baseline scores for some behaviors were not affected by changes in previously targeted behaviors of the intervention.

And the final objective is to determine to which extent independent observations of children's classroom behaviors coincide with teacher's and parents' perception about changes in competence development and levels of externalizing problems.

## **3. METHOD**

### **3.1. Participants**

The selection of the participants included in this single case study was done according to two criteria: teacher ratings of both deficient emotional and social competencies, placing the participant in the high risk group, as well as receiving an externalizing problem score in the lowest 10 percentiles. These participants were selected from the sample described in detail in

Study 1. However, in this study we included only participants whose parents did not exhibit additional risk in terms of harsh/inconsistent discipline strategies. In consequence, the total number of children included in this study was four ( $n = 4$ ), preschoolers aged between 42- and 54-months. Among the four participants the three were boys. All children attended more than 75% of the classroom curriculum activities, but only two of the mothers received full parental intervention dosages.

### 3.2. Research design

For the purposes of this study we selected a non-concurrent multiple-baseline design (Watson & Workman, 1981). As opposed to the concurrent designs, non-concurrent designs do not provide baseline observations in the same timeframe, but rather include the participants as they become available for intervention (Freeman & Mash, 2007). Non-concurrent designs are in fact a series of A-B (baseline-intervention) replications, in which the baseline length is predetermined, but participants are randomly assigned to each phase length (Carr, 2005; Christ, 2007). Measurements were conducted during four phases: baseline, intervention, maintenance, and follow-up. These measurements consisted of probes.

### 3.3. Dependent measures

#### 3.3.1. Child behavior observations

In this study we obtained four types of behavioral measures for children’s classroom behaviors, which are defined and described in Table 1. For each type of behavior percentages were derived based on the total observed behaviors during an observation session (e.g., the percentage of child compliance was obtained by dividing the total number of compliant behaviors to the sum of compliant and non-compliant behaviors observed and then multiplying by 100, etc.).

Table 2. Description of positive and negative child behaviors observed in the classroom

<b>Observed positive behaviors</b>	<b>Definition</b>
1. compliance to teacher’s requests	- performing the requested behavior (e.g., the child performs the behavior without further prompting from the teacher; says “yes” when asked to do something, and follows through the promise);
2. adequate responses to frustrating events	- reorienting attention or seeking help from the teacher when denied access to a toy or not being allowed to play in a group of children; - waiting patiently when the teacher cannot answer immediately to his/her requests;
3. prosocial behaviors	- sharing toys with other children; - responding positively when another child makes a request for a toy; - offering to help or comforting a child when something bad happens to him (e.g., falling or being hit); - taking turns in playing with a toy; - asking for permission to play with another child’s toy.
4. cooperative play	- playing in a group of children and using verbal exchanges with other play-mates (e.g., “you are ... and I am going to be ...”, “Let’s build a train”, etc.); - inviting other children to join him/her in playing; - approaching a group of children and blending in the game; - making an overt request to play with other children (e.g., “Can I come and play with you?”).
<b>Observed negative behaviors</b>	
1. non-compliance to teacher’s requests	- refusing to perform the behavior requested by the teacher (e.g., the child ignores the teacher’s request, and continues to do something else; says “no” when asked to do something);

- |   |   |
|---|---|
| 2. inadequate responses to frustrating events | - crying or anger tantrum when asked to do something, or being denied access to a toy;<br>- trying to get the teacher's attention with repeated requests;   |
| 3. aggressive behaviors                       | - physical aggression (e.g. hitting, slapping, biting, scratching, or throwing objects);<br>- grabbing a toy without obtaining permission;<br>- intruding in other children's play without permission;<br>- destroying other children's toys; |
| 4. isolated play                              | - playing alone and or playing without exhibiting verbal exchanges with another child.  |
- 

The observers were blind to the intervention phases and the intervention's content. They conducted 1-2 observations per week, 2 hours per day in the classroom. Each observation took place during the morning activities. In addition, the first author conducted reliability checks once every two weeks. Data for calculating interobserver agreement was obtained for 50% of the observation sessions. The agreement rate was calculated as the number of agreements divided by the number of agreements plus disagreements multiplied by 100. For the first participant the interobserver agreement ranged between 85-93%; in the case of Rareş, we obtained agreement rates between 82-91%; for Radu, 86-95%; and for Alex between 84%-94%.

### **3.3.2. Teacher and parent assessments**

The measures for assessing children's emotional and social development and externalizing problems by parents and teachers are described in detail in Studies 1 and 2. Also, screening methods based on parental self-ratings of discipline strategies are described in Study 2.

### **3.4. Intervention**

The classroom intervention is described in detail in Study 1. We selected for the purposes of this to evaluate intervention modules 1, 3, 4, and 5.

## **4. RESULTS AND DISCUSSION**

### **4.1. Analysis strategy**

For the purposes of this study, data analysis involved interpretation of: 1) mean shift; 2) variability within and across phases; 3) level changes; 4) trend changes; and 5) serial dependency. Mean shift is calculated as the difference between baseline and postintervention means. Variability in the data is reflected by the two standard deviation method (2 SD) The presence of two consecutive data points outside the 2 SD deviation range of baseline scores is considered a sign of significant changes (Nourbakhsh & Ottenbacher, 1994). Level changes were interpreted using the percentage of non-overlapping data (PND), a nonparametric method indicating the percentage of data points from the intervention phase which fall above or below the highest score from the baseline (Scruggs, Mastropieri, & Casto, 1987). The presence of significant trends was evaluated using the *C* statistic, a time-series analysis method, which is best suited for small data sets (Tryon, 1982). The *C* statistic divided by its standard deviation produces a *Z* value, which was carried out at a level of  $p < .01$ . Polynomial contrasts, *a priori* planned comparisons were computed using univariate ANOVAs to test for possible significant linear trends. Finally, the presence of serial dependency, an inherent characteristic of single-subject studies, in which observations are thought to be dependent, was assessed using the Lag1 autocorrelation (Borckhardt, Nash, Murphy, Moore, Shaw et al., 2008).



## **4.2. Results and discussion for children's classroom behaviors**

### **4.2.1. Results for compliance to rules**

In the case of Oana significant changes in variability and level for compliance occurred during the maintenance phase (Table 2). The presence of significant linear trends was confirmed by planned comparisons on intervention to maintenance, and maintenance to follow-up scores,  $t(11) = 3.67, p < .01$ , and  $t(11) = 7.14, p < .001$ . These data suggest that the intervention elicited significant changes in the maintenance phase, and the intervention continued to exert effects at follow-up.

For Rareş postintervention effects on compliance were sustained by changes in variability, level, and the presence of a significant baseline-intervention trend ( $p < .01$ ) (Table 3). Baseline-intervention contrast indicated that in fact there was a significant shift in the data immediately after the intervention,  $t(6) = 4.19, p < .01$ .

In the case of Radu, compliance ratings registered a positive mean shift from baseline to intervention, but the 2 SD method and PND indicated no significant changes in variability and level (Table 4). The maintenance to follow-up contrast confirmed the fact that the trend in the data was linear,  $t(11) = 4.10, p < .01$ . In sum, there was no significant intervention effect on compliance.

In the case of Alex, positive changes occurred in the maintenance phase, when variability changes measured with the 2 SD and level changes computed with the PND indicated the presence of a significant effect (Table 5). A significant linear trend was found from intervention to maintenance,  $t(12) = 3.64, p < .01$ , indicating that the intervention was effective in eliciting increased compliance in the maintenance phase.

### **4.2.2. Discussion for compliance to rules**

The first module included strategies designed to enhance children's compliance to rules. A combination of antecedent and consequence based strategies proved effective for three of our participants confirming previous studies that this approach is the most effective in eliciting changes (Chandler et al., 1999; Conroy et al., 2005). The first observation is regarding the fact that in the case of Oana and Alex, significant changes in their compliance were detected in the maintenance phase of the intervention, while for Rareş the effect was observable immediately postintervention (Figure 1). One possible explanation for these patterns is age-related. More precisely, previous studies indicate that non-compliance is most often characteristic for 3-year-olds, mostly because their experience with rule internalization is limited (Lee, Belfiore, & Gormley, 2008; Lee, Belfiore, Scheeler, Hua, & Smith, 2004). Interestingly, the delayed effect occurred in the case of Oana and Alex, both of them being younger than the other two boys.

The lack of effects in the case of Radu can be seen as a consequence of the fact that his baseline scores indicated a compliance rate of about 50% the highest among all participants. Since Radu was only at risk, it might be possible that although the intervention produced changes, these were not observable due to the fact that they were not clinically relevant symptoms. Radu, as Rareş had previous experiences with classroom rules, which would give further support to the notion that once children experience some degree of rule internalization, compliance rates are higher. An alternative explanation could be provided by the fact that although the activities in the curriculum were implemented, teachers reported less use of coaching strategies in daily activities, as a consequence of the large number of children in the classroom.

### **4.2.3. Results for tolerance frustration**

Frustration tolerance observation showed for Oana significant variability and level changes in the maintenance phase. A significant linear trend was also found from the intervention to the maintenance phase,  $t(7) = 2.32, p < .05$ . These data would suggest that significant intervention effects were observable in the maintenance phase.

For Rareş the 2 SD and PND indicated significant variability and level changes in the maintenance phase (Table 3). However, the intervention-maintenance comparisons indicated that the linear trend was only marginally significant ( $p < .10$ ), indicating that the intervention was not efficient.

The data series for Radu showed that changes in level and variability, and the presence of a linear trend was confirmed for the follow-up phase,  $t(9) = 4.46, p < .01$ , indicating that the intervention did not exert effects on emotion regulation strategies.

The data for Alex indicated level and variability changes consistent with the maintenance phase (Table 5). However, a significant linear trend was detected only from the maintenance to the follow-up phase  $t(9) = 2.46, p < .05$ , suggesting that the intervention was not efficient in eliciting changes regarding emotion regulatory strategies.

Table 2. Means, standard deviations, mean shift, variability changes, level changes and autocorrelations for observed behaviors for Oana

	Mean (range)	Standard deviation	Mean shift	2 SD	PND	r(lag 1)
Compliance to rules						
Baseline	26.75 (17-38)	8.96				.17
Intervention	32.00 (20-50)	13.14	5.25	NS	25%	-.45
Maintenance	50.33 (33-67)	11.27	23.58	S	78%	-.17
Follow-up	95.75 (83-100)	8.50	71.00	S	100%	-.42
Frustration tolerance						
Baseline	22.63 (0-50)	16.94				.55
Intervention	27.67 (0-50)	25.42	5.04	NS	0%	-.59
Maintenance	66.67 (33-100)	23.07	44.04	S	67%	.11
Follow-up	85.50 (67-100)	17.06	61.87	S	100%	-.66
Prosocial behaviors						
Baseline	24.00 (0-50)	15.45				.01
Intervention	42.67 (33-50)	8.74	18.67	NS	0%	-.35
Maintenance	55.67 (50-67)	9.81	31.67	NS	25%	-.33
Follow-up	86.75 (67-100)	16.19	62.75	S	100%	-.78*
Cooperative play						
Baseline	34.64 (0-67)	18.30				.42
Intervention	72.33 (50-100)	25.42	37.67	NS	33%	-.48
Follow-up	71.00 (50-100)	20.93	36.36	NS	25%	-.11

#### 4.2.4. Discussion for frustration tolerance

Although no previous study has specifically targeted behaviors that are sustained by emotion regulation strategies, our data suggest that strategies used for emotional competence development can be successfully used to enhance children frustration tolerance (Gresham, 2002; Sheridan et al., 1999). Anger management techniques such as the “turtle technique”, modeling, role-play, feedback, as well as behavioral strategies for reinforcing adequate behaviors proved effective (Blum, 2001). The use of adequate strategies in order to deal with frustrating events was significantly increased only in the cases of Oana and Rareş, but in the maintenance phase of the intervention (Figure 1). This might be explained by taking into consideration that immediate postintervention changes might be difficult to observe in the case of complex behaviors, which require extensive practice and reinforcement (Sugai & Lewis, 1999).

As stated before, in the case of Radu, there was a marginally significant linear trend from intervention to the maintenance phase. Since Radu exhibited the lowest levels of emotion regulation strategies among our participants, the lack of a significant effect might suggest that in situations where a particular skill is not developed, children might be in need of highly individualized interventions that cannot be provided in the context of classroom-based indicated interventions. Another possibility is that the level of implementing extra-curricular strategies for coaching children during emotional-eliciting situations might have been less extensively used as suggested by our previous discussion in the context of rule compliance.

In Alex's case, the lack of significant improvements could be placed in the broader context of external variables influencing the outcomes of an intervention. Initial progress was blocked after the third intervention month during which his mother underwent surgery, and was unable to attend the follow-up individual session or the other parent group sessions. His ulterior progress was however confirmed by our follow-up measures which indicated that between the maintenance and follow-up phase there was an increase in the use of adequate tolerance frustration strategies, which were consistently employed in about 60% of the situations.

#### 4.2.5. Results for prosocial behaviors

Both variability and level changes in the data series for Oana indicated that the intervention was not effective for prosocial behaviors (Table 2). Testing for polynomial contrasts indicated that there was not significant linear trend, but a significant change occurred from maintenance to follow-up,  $t(7) = 2.91, p < .05$ . These data show that the intervention did not produce significant effects.

For Rareş, the data series showed significant variability change, as well as significant level changes in the maintenance phase (Table 3). The presence of a significant linear trend from intervention to maintenance,  $t(5) = 2.66, p < .05$ , suggests that the intervention was effective in eliciting effects on prosocial behaviors.

Table 3. Means, standard deviations, mean shift, variability changes, level changes and autocorrelations for observed behaviors for Rareş

	Mean (range)	Standard deviation	Mean shift	2 SD	PND	r(lag 1)
Compliance to rules						
Baseline	42.20 (33-50)	7.56				-.13
Intervention	65.00 (57-71)	7.21	22.80	S	100%	.12
Maintenance	66.89 (56-78)	8.30	24.69	S	100%	-.54*
Follow-up	69.00 (60-80)	10.15	26.80	S	100%	-.59
Frustration tolerance						
Baseline	33.75 (0-60)	28.26				-.03
Intervention	42.33 (0-67)	36.83	8.58	NS	25%	-.66
Maintenance	77.86 (50-100)	18.68	44.11	S	86%	.46
Follow-up	78.33 (70-80)	4.89	44.58	S	100%	-.17
Prosocial behaviors						
Baseline	28.45 (7-57)	14.45				.05
Intervention	40.00 (30-57)	14.80	11.15	NS	0%	.16
Maintenance	62.50 (53-70)	7.89	34.05	S	75%	.09
Follow-up	75.50 (60-100)	17.45	47.05	S	100%	-.10
Cooperative play						
Baseline	71.57 (50-85)	10.07				.13
Intervention	75.50 (67-80)	6.14	4.07	NS	0%	-.38
Follow-up	91.25 (80-100)	10.31	36.36	S	50%	.15

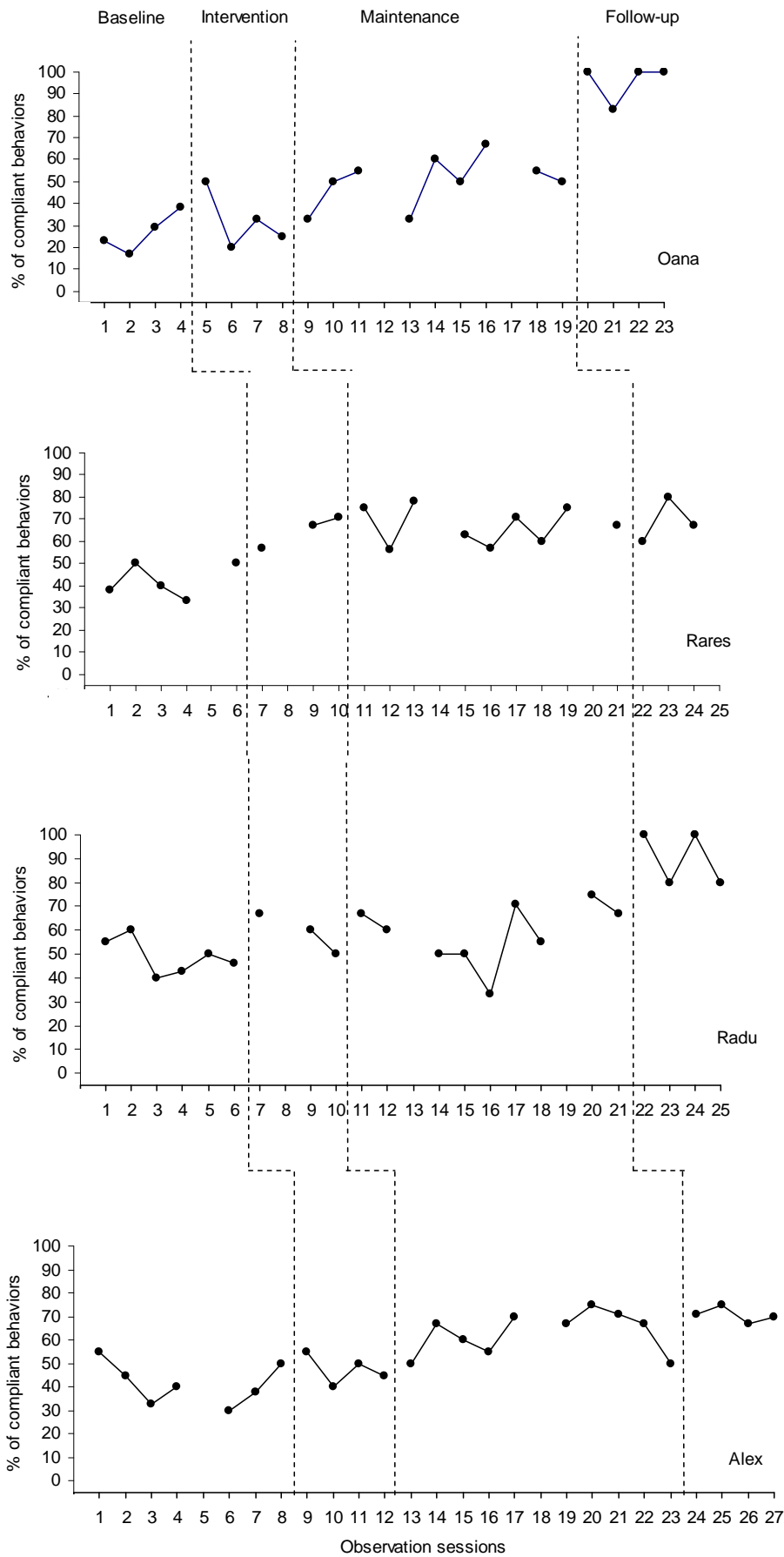


Figure 1. Observation of compliance to rules across four at risk children in a non-concurrent MBD

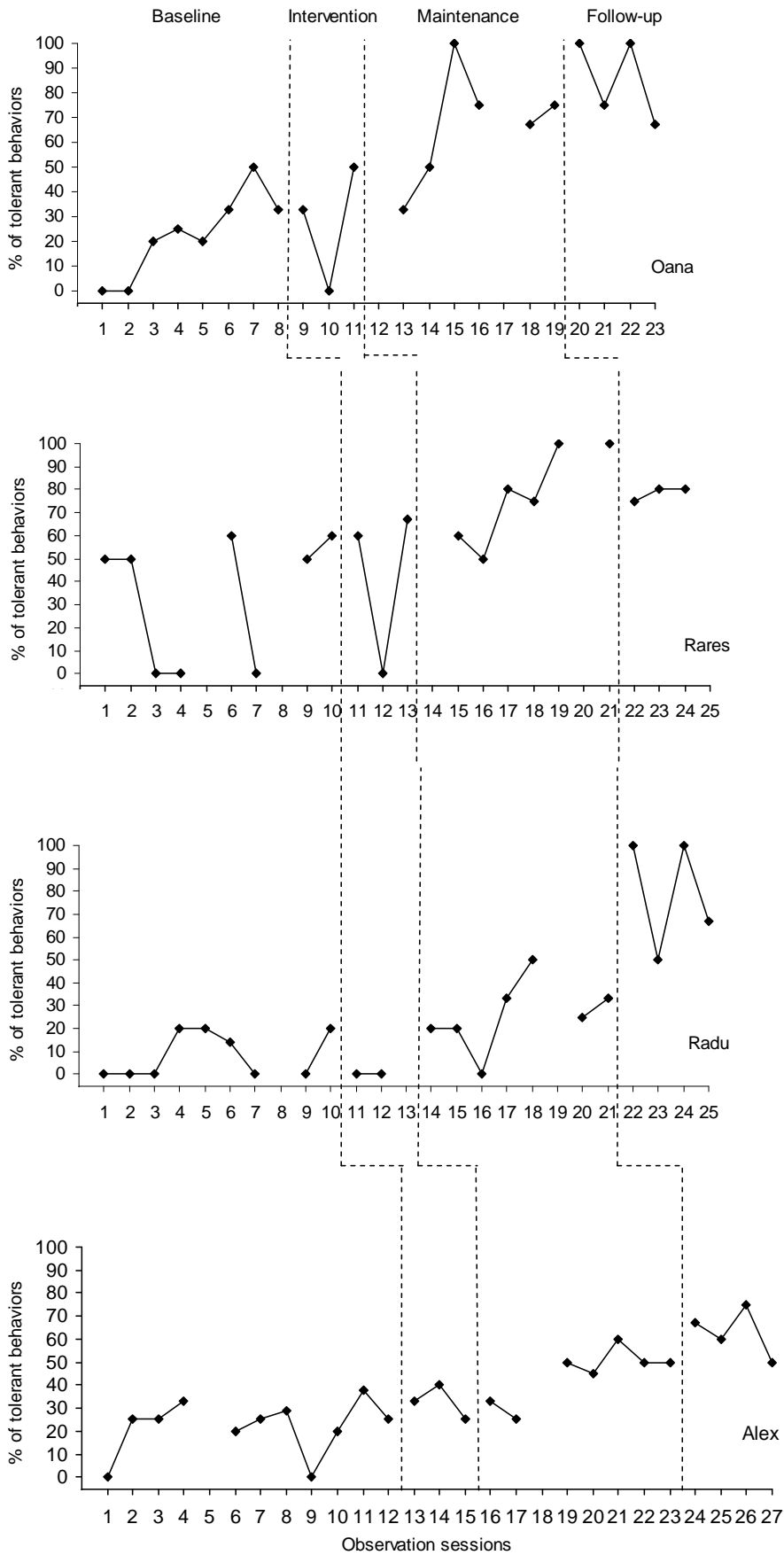


Figure 2. Observation of frustration tolerance behaviors across four participants in a non-concurrent MBD

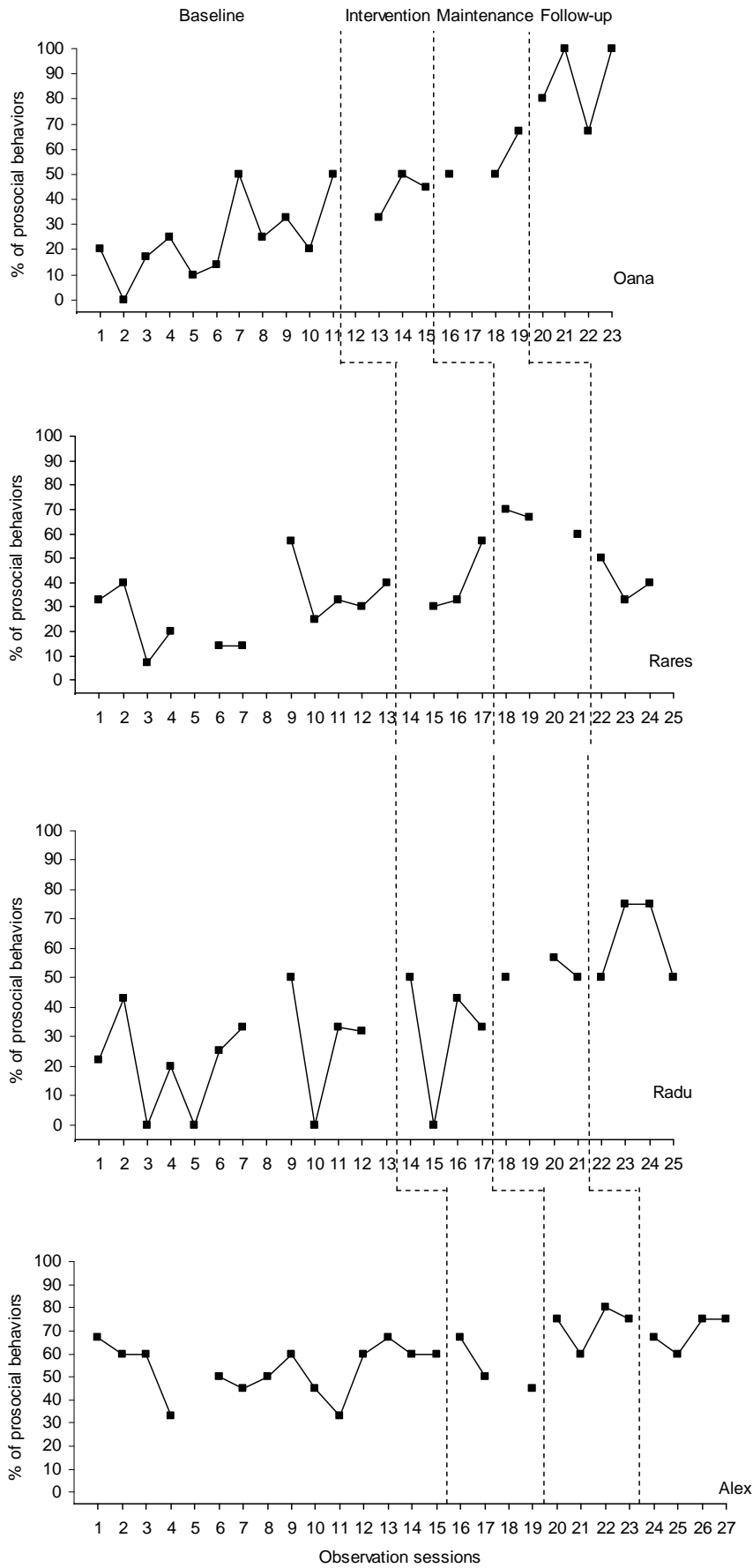


Figure 3. Observation of prosocial behaviors across four participants in a non-concurrent MBD

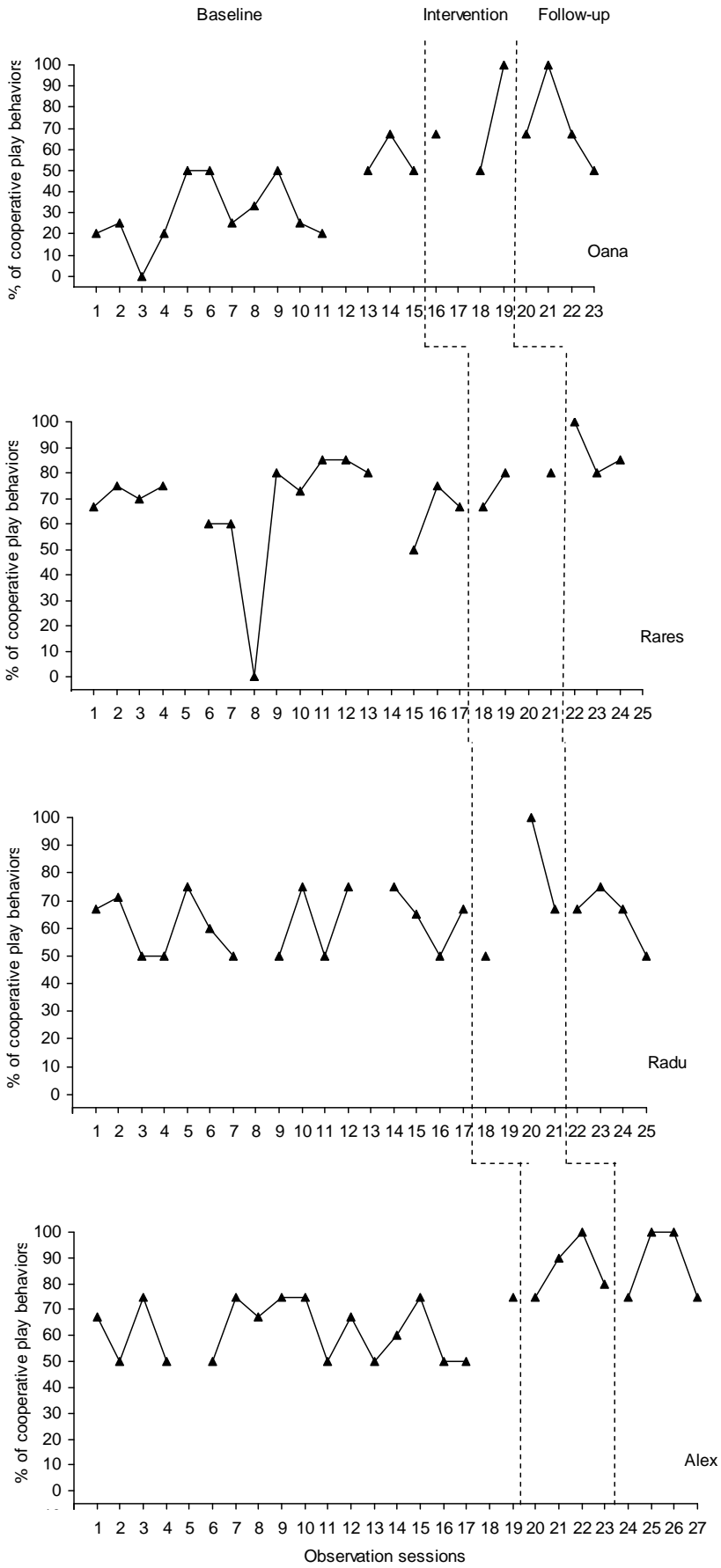


Figure 4. Observation of cooperative play behaviors across four participants in a non-concurrent MBD

Where prosocial behaviors are concerned, the data indicate a positive mean shift in all subsequent baseline phases (Table 4). However, variability, level, and trend indices suggested that the intervention was not effective for Radu.

For Alex's prosocial behaviors, the changes in level indicated that the intervention exerted moderate effects (Table 5). The following contrasts yielded a significant linear trend for the intervention-maintenance phase,  $t(4) = 2.44$ ,  $p < .05$ , showing a significant intervention effects in the maintenance phase.

Table 4. Means, standard deviations, mean shift, variability changes, level changes and autocorrelations for observed behaviors for Radu

	Mean (range)	Standard deviation	Mean shift	2 SD	PND	r(lag 1)
<b>Compliance to rules</b>						
Baseline	49.00 (40-60)	7.54				.04
Intervention	59.00 (50-67)	8.54	10.00	NS	33%	-.06
Maintenance	58.67 (33-75)	13.14	9.67	S	44%	.06
Follow-up	90.00 (80-100)	11.55	41.00	S	100%	-.75*
<b>Frustration tolerance</b>						
Baseline	8.22 (0-20)	9.92				.13
Intervention	0.00 (0-0)	0.00	-8.22	NS	0%	.12
Maintenance	25.86 (0-50)	15.40	17.67	S	57%	-.79*
Follow-up	79.25 (50-100)	24.94	71.03	S	100%	-.17
<b>Prosocial behaviors</b>						
Baseline	23.45 (0-50)	17.35				-.37
Intervention	31.50 (0-50)	23.13	8.05	NS	0%	-.63
Maintenance	52.33 (50-57)	4.04	28.88	NS	25%	-.33
Follow-up	62.50 (50-75)	14.43	39.05	S	50%	-.25
<b>Cooperative play</b>						
Baseline	62.00 (50-85)	10.97				-.37
Intervention	72.33 (67-80)	25.42	10.33	NS	33%	-.11
Follow-up	64.75 (80-100)	10.53	2.75	NS	0%	.04

#### 4.2.6. Discussion for prosocial behaviors

Results for the third category of behaviors, prosocial attitudes increased in the maintenance phase significantly for Rareş and Alex, while for Oana we found marginally significant improvements (Figure 3). These findings lend support to our previous assumption that complex behaviors require more time to become observable. In both cases, the frequency of prosocial behaviors increased significantly indicating that problem-solving, and reinforcement of prosocial behaviors did have the expected effect on reducing aggression. Previous studies indicated that increases in prosocial behavior related to the use of behavioral and social learning strategies is effective in building children's prosocial behaviors, and lowering levels of aggression (DuPaul, McGoey, Eckert, & VanBrackle, 2001; Matthys, Cuperus, & Van Engeland, 1999; Sugai & Lewis, 1996).

The lack of significant effects for Oana might be related to the fact that she was somewhat of a leader in her play group and most of the children followed her lead during classroom games. Furthermore, some of her strategies for imposing her point of view, resulted in intrusions and hitting other children. This required teachers to do extensive problem-solving, and redirecting the negative behavior towards productive attitudes. In turn, a significant trend was found only at follow-up, suggesting that it might have taken longer to make changes in her behavior.

Radu was again the only participant who did not benefit from the intervention. As developing prosocial behavior requires extensive problem-solving in conflict situations in the



classroom, it is possible that the similar reasons cited for the other behavior account for the lack of effects encountered for these behaviors.

#### 4.2.7. Results for cooperative play

The data series for Oana’s play cooperation, suggest the presence of small effects postintervention in terms of variability and level changes (Table 2). We found a significant linear effect for the baseline data set,  $t(12) = 2.91, p < .05$ , suggesting that the intervention elicited effects on cooperative play at the same time with the effects on prosocial behaviors.

Play cooperation behaviors remained stable across the baseline and intervention phase. There were no significant variability, level, and trend changes (Table 3). The maintenance to follow-up contrast confirmed the presence of a significant linear trend,  $t(5) = 2.68, p < .05$ , indicating that the intervention was not effective in the case of Rareş.

For Radu’s cooperative play we found positive mean shifts from the baseline, but there were no changes in variability, level, or trend. In this case the intervention did not exert the expected effects.

The changes in variability were significant in both the intervention and follow-up phase, as measured by the 2 SD method (Table 5). The PND indicated that the intervention had a moderate effect on Alex’s cooperative play behaviors. Although there were no significant trends, based on the changes in level and variability, the intervention was effective in increasing cooperative play behaviors immediately postintervention.

Table 5. Means, standard deviations, mean shift, variability changes, level changes and autocorrelations for observed behaviors for Alex

	Mean (range)	Standard deviation	Mean shift	2 SD	PND	r(lag 1)
Compliance to rules						
Baseline	41.57 (30-55)	9.00				.09
Intervention	47.50 (40-55)	6.45	5.93	NS	0%	-.65
Maintenance	63.20 (50-75)	8.92	21.63	S	70%	.03
Follow-up	70.75 (67-75)	3.30	29.18	S	100%	-.37
Frustration tolerance						
Baseline	21.82 (0-28)	12.99				-.11
Intervention	32.67 (25-40)	7.51	10.85	NS	33%	-.01
Maintenance	43.56 (25-60)	13.45	21.74	S	71%	.48
Follow-up	63.00 (50-75)	10.61	41.18	S	100%	-.60
Prosocial behaviors						
Baseline	53.57 (33-67)	11.19				.15
Intervention	54.00 (45-67)	11.53	1.57	NS	0%	-.20
Maintenance	72.50 (60-87)	8.66	18.93	NS	75%	-.47
Follow-up	69.25 (60-75)	7.23	15.68	NS	50%	.01
Cooperative play						
Baseline	62.41 (50-75)	11.45				-.25
Intervention	91.25 (75-100)	11.81	28.84	S	75%	-.32
Follow-up	87.50 (75-100)	14.43	23.09	S	50%	.25

#### 4.2.8. Discussion for cooperative play

The intervention was again effective on children’s cooperative play patterns in the cases of Oana and Alex (Figure 4). Whereas, Alex exhibited increased cooperation during play sessions immediately postintervention, for Oana these changes occurred in the intervention phase for prosocial behaviors. Cooperation strategies are as previously discussed strategies highly related to prosocial behaviors such as sharing, turn-taking, or offering help (Marion,

2003; Sheridan et al., 1999). A possible carry-over effect might have taken place in the case of these highly related skills, which can account for the rapid changes in cooperative play. Furthermore, play cooperation is also a complex behavior, and as a consequence immediate postintervention effects should have been less likely. Results for these children would suggest that at least in some cases interventions aiming to develop prosocial skills might boost the intervention's effects on other types of behaviors.

However, a dissimilar pattern was found for older children like Radu and Rareș, whose average baseline cooperative play was around 60 to 75%. The lack of effects in these cases might be seen as a consequence of children's development and their increased involvement in group play with age (Cutting & Dunn, 2006; Howe, Rinaldi, Jennings, & Petrakos, 2002). Moreover, Rareș's cooperative play behaviors exhibited a linear trend from intervention to follow-up suggesting that an increased preference for group play had developed during the time elapsed from the end of the intervention to follow-up.

### **4.3. Results and discussion for teacher and parent ratings**

Another aspect which we were interested in was the teacher's perception on children's progress compared with the data from the behavior observation. The children, who benefited the most from participating to the intervention according to the data from the classroom observation, were Oana, Rareș, and Alex. For these children, all subsequent teacher ratings were in either the moderate risk category for competencies development, and received above cut-off externalizing problems scores. A similar pattern was also found for Radu, who did not exhibit significant changes in any of the observed behaviors. This would suggest that teachers might be biased by their involvement with the intervention. More specifically, teachers could have overestimated the progress as a result of the fact that they were responsible for both implementing and assessing the outcomes. Such a perspective is supported by the positive evaluation statements that teachers made in respect to the effects of the program "the children are behaving better", "the level of noise has dropped", "the conflicts are now less likely to occur", "we have made some amazing progress compared to the beginning of the school year", or "I am happy to see most of them playing together", indicate that positive changes were observable for all children in the classroom.

Parental perceptions about their children's skill development and behavior problems vary from highly overlapping (Rareș) to highly different (Radu) from teacher ratings, supporting the notion that in non-clinical samples, the level of concordance in terms of risk perception is somewhat lower (Achenbach et al., 2002). Parent ratings indicate gains in terms of children's competencies for Oana, Rareș, and Alex. These parent ratings are in fact an assessment of behavior generalization across settings, as parents were taught to support children's skills at home (Hughes et al., 2005). Interestingly, consistent decreases in children's behavior problems were found for children whose parents attended the training. This would support the notion that parents are more likely to attend when they perceive a higher degree of risk (Prinz & Sanders, 2007). Somewhat contrary to our data, Rareș's parents assessed him more conservatively immediately after the intervention on externalizing problems. The first explanation would be that maybe progress that was actually more visible in the classroom, were teachers constantly implemented activities and strategies based on a teach and practice sequence. Although his parents participated to our training sessions, transfer to home settings is achieved over a longer period of time if parents deal with multiple behavior problems.

# **Study 4: CHANGES IN OBSERVED CLASSROOM BEHAVIORS AND PARENTAL DISCIPLINE STRATEGIES FOR PRESCHOOLERS AT RISK FOR CONDUCT DISORDERS AND THEIR PARENTS: A MULTIPLE BASELINE EVALUATION**

## **1. INTRODUCTION**

This study was mainly interested in identifying the effects of the classroom intervention on high risk children's behaviors. There is an increased consensus that single-subject studies should take into consideration selecting participants with similar characteristics in terms of risk factors, thus allowing for a more comprehensive and specific interpretation of intervention effects (Dunlap, Strain, Fox, Carta, Conroy et al., 2006). In turn, based on our knowledge about developmental pathways which are responsible for early onset conduct problems, we believe that children who are perceived at risk by their teachers and their parents exhibit harsh and/or inconsistent parenting strategies are more likely to exhibit behavior problems as a consequence of their parents' inability to deal with inappropriate behaviors (Nicholson et al., 2005).

The strategies used for assessing parent intervention outcomes have most frequently employed behavior observations of changes in parenting behaviors (McGoey & DuPaul, 2000; Marchant, Young, & West, 2004), or self-ratings of particular behaviors on Likert-type rating scales (Lees & Ronan, 2008). Self-monitoring has been more frequently used as an intervention method directed at raising awareness about negative behaviors, and thus eliciting changes in the targeted behaviors (Handleman & Harris, 1984; Smeets & Striefel, 1988). Although considered less objective than observational methods, our choice was driven by two reasons: 1) observing parents at home is an intrusive strategy especially when dealing with community-based interventions; and 2) the self-monitoring exercise was a part of the parent training homework designed to promote changes in parenting strategies. Another argument in favor of this strategy is related to some concerns that extensive focus on children's negative behaviors might actually be detrimental to obtaining the extinction of inappropriate behaviors (Conoley et al., 2003).

## **2. OBJECTIVES**

The first objective of this study was to test the efficacy of the multifocused prevention program on high risk children with high risk parents. We were interested in determining both changes in children's classroom behaviors (e.g., compliance to rules, frustration tolerance, prosocial skills, and cooperative play), as well as parents' use of praise and positive discipline strategies. Our first expectation is that children should exhibit significant improvements in their classroom behaviors, although we expect such results especially for underdeveloped skills. A similar rationale was applied for evaluating changes in parents' discipline strategies, as we expect improvements in areas where parents are mostly in need of intervention.

The second objective was to determine to which extent the intervention module targeting a particular child or parent behavior has determined significant changes immediately postintervention, or in subsequent phases (e.g., maintenance, follow-up). Also, we are interested in identifying possible carry-over effects which might arise as a consequence of the fact that the children's observed behaviors are related to some degree.

Our final objective was to use the data from observing children's classroom behaviors, parental self-monitoring, and evaluating whether these data converge with the questionnaire assessments.

### **3. METHOD**

#### **3.1. Participants**

In selecting the participants for this study we employed two criteria related to teacher evaluations of children's behavior namely: 1) below cut-off scores for teacher assessed emotional and social competencies development; and 2) below cut-off scores for teacher evaluated externalizing problems. The third criterion was that parents of these children obtained below cut-off scores on self-ratings of harsh and/or inconsistent discipline strategies. These participants were selected from the sample described in detail in Study 1. Participants in this study were three preschoolers ( $n = 3$ ) aged between 41- and 47-months, and their mothers. Two of our participants were boys. All children attended more than 75% of the activities from the classroom curriculum, while only two mothers (Daria and Alexandru) attended more than  $\frac{3}{4}$  of the group sessions.

#### **3.2. Research design**

We used a multiple baseline design (MBD) across participants for multiple behaviors, which was described in Study 3. Measurements were conducted during four phases: baseline, intervention, maintenance, and follow-up. Weekly probes were used instead of continuous observations, due to the fact that more frequent observations were difficult to conduct. For parents we used a self-monitoring strategy, which required parents to observe and record weekly their discipline attitudes towards their children's behaviors.

#### **3.3. Dependent measures**

##### **3.3.1. Child behavior observations**

Children's classroom behaviors were assessed by observing the frequency of compliant, tolerant, prosocial, and cooperative play behaviors. A detailed description of children's positive and negative behaviors is provided in Study 3. The percentages obtained for the assessed behaviors were derived from the total number of positive behaviors divided by the sum of positive and negative behaviors, which was multiplied by 100.

Data for calculating interobserver agreement was obtained for 50% of the observation sessions. The agreement rate was obtained using the following formula: the number of agreements divided by the number of agreements plus disagreements multiplied by 100. For the first participant the interobserver agreement ranged from 80% to 85%; for the second participant the rate of agreement between observers was 85%- 93%, while for the third the data indicated 88% to 93% agreement rates.

##### **3.3.2. Parent self-monitoring**

Parental behaviors were evaluated using self-monitoring sheets. Parents were asked to complete once a week a self-monitoring exercise, which included listing the child's appropriate behaviors during the day and their reactions, which could be praising, offering a reward, or ignoring the positive behavior. On the other hand, parents recorded the child's inappropriate behaviors and identified their attitudes, which could be positive discipline strategies (e.g., ignoring, withdrawing privileges/timeout, redirecting behavior), or harsh/inconsistent discipline strategies (e.g., slapping, yelling, threatening with punishment, but not following through) (Table 1). Percentages were obtained dividing positive parent strategies to the sum of positive and negative parent attitudes and multiplying the result by 100. For example, if two adequate

strategies were used in response to one child behavior (e.g., redirecting and withdrawing privilege), this was recorded as a single appropriate strategy.

### 3.3.3. Teacher and parent assessments

The measures used for assessing children’s emotional and social development, an externalizing problems by parents and teachers are described in detail in Studies 1 and 2. Also, screening methods based on parental self-ratings of discipline strategies are described in Study 2.

Table 1. Description of the parent self-monitoring sheet containing the appropriate/inappropriate child behavior and parent attitudes

Observed appropriate behavior	Parent attitude						
Please list the appropriate behaviors of your child during this day (e.g., gathering toys, cleaning room, playing nicely with other children, offering to help with chores, cleaning teeth, etc.)	Mark the box which best describes your reaction to your child’s appropriate behaviors:						
	Praise/offer a reward			Ignore			
Observed inappropriate behaviors	Parent attitude						
Please list the inappropriate behaviors of your child during this day (e.g., refusing to do something you asked, throwing with toys, hitting other children, yelling, anger tantrum, trying to get attention when you are busy, etc.)	Mark the box which best describes your reaction to your child’s inappropriate behaviors:						
	Ignore	Yell	Slap	Withdraw privilege/timeout	Threaten with punishment, but not follow through	Redirect behavior and explain	

### 3.4. Intervention

The classroom intervention is described in detail in Study 1. We selected for the purposes of this to evaluate intervention modules 1, 3, 4, and 5. The parent training is also described in detail in Study 1, and we evaluated sessions 2 and 3 of the parent group training.

## 4. RESULTS AND DISCUSSION

### 4.1. Results and discussion for children’s classroom behaviors

#### 4.1.1. Results for compliance to rules

The data on Daria’s compliance indicate significant variability change occurred during the maintenance phase, while changes in level indicated only a low effect of the intervention (Table 2). We found a significant linear trend within the maintenance phase: the first 3 vs. the next 8 observations,  $t(15) = 3.44, p < .01$ . These data suggest that the intervention elicited changes immediately after the the prosocial skills intervention was implemented.

Tudor’s compliance showed significant gains, as the 2SD method yielded a significant shift in variability in the maintenance phase, and the PND indicated that the intervention was highly effective in the same phase (Table 3), but there were no significant linear trends ( $p$ ’s  $> .05$ ). Based on these findings, we concluded that the intervention exerted an effect on this child’s compliance in the maintenance phase.

The intervention's effects on Alexandru's compliance showed no changes in variability or level (Table 4). The only linear trend was found from maintenance to follow-up,  $t(11) = 2.99$ ,  $p < .05$ . These data confirm that the intervention did not exert significant effects on compliance.

Table 2. Means, standard deviations, mean shift, variability changes, level changes and autocorrelations for observed behaviors for Daria

	Mean (range)	Standard deviation	Mean shift	2 SD	PND	r(lag 1)
<b>Compliance to rules</b>						
Baseline	32.00 (13-50)	15.77				-.73*
Intervention	36.00 (25-43)	9.64	4.00	NS	0%	-.41
Maintenance	55.27 (25-80)	20.41	23.27	S	55%	.23
Follow-up	77.00 (71-83)	8.49	45.00	S	100%	-
<b>Frustration tolerance</b>						
Baseline	0.00	0.00				-
Intervention	11.00 (0-20)	10.15	11.00	S	67%	-.39
Maintenance	73.50 (0-67)	23.45	61.50	S	86%	-.30
Follow-up	63.00 (67-80)	9.19	52.00	S	100%	-
<b>Prosocial behaviors</b>						
Baseline	11.10 (0-33)	12.70				-.09
Intervention	41.75 (0-67)	32.12	30.65	S	50%	-.21
Maintenance	53.25 (33-80)	19.55	42.15	S	100%	-.49
Follow-up	71.00 (67-75)	5.66	59.90	S	100%	-
<b>Cooperative play</b>						
Baseline	30.79 (0-50)	13.79				-.26
Intervention	66.75 (50-100)	22.56	35.96	S	75%	-.10
Follow-up	92.50 (85-100)	10.61	61.71	S	100%	-

#### 4.1.2. Discussion for compliance to rules

Compliance to teacher's requests had increased postintervention only in the case of one of the observed children, namely Tudor (Figure 1). Tudor's teachers commented on his progress saying that overall he is less disruptive and accepts more easily the teacher's requests. Also, our data sustain the notion that previous exposure to rules might in fact promote faster generalization of such skills. The data from this study confirm that children with observed deficits in compliance benefit more promptly from strategies directed at improving it, as a function of chronological age (Lee et al., 2008; Lee et al., 2004). This indicated that some previous knowledge and experience with rules might be beneficial for internalizing rules as in the case of Tudor.

In Alexandru's case a possible explanation for the lack of intervention's effects is that his baseline scores indicated a compliance frequency of around 50%, which would indicate that significant effects are less likely to be observable due to high baseline scores. The most interesting pattern of results was obtained for Daria, whose compliance scores improved immediately after the intervention for tolerance frustration skills was finished. One possible explanation is that the intervention on frustration tolerance might have positively affected her ability to comply with rules. It is established that increased emotion regulation abilities are positively associated with children's ability to comply with teacher's requests (Stifter, Spinrad, & Braungart-Rieker, 1999). Hence, for some children it might be important to have added training for emotion regulation strategies to help improve the effects of the intervention for compliance (Figure 1).

For Daria and Tudor whose scores indicated gains in compliance, the intervention's effects were maintained at follow-up, suggesting that in fact a structured, consistent environment provided in the classroom with clear expectations and consequence-based strategies is helpful in

developing children’s compliance (Wahler, 1997). These results show that classroom-based interventions on children at risk benefit to a similar extent as clinically referred children from a combination of antecedent, as well as consequence-based strategies (Chandler et al., 1999; Conroy et al., 2005).

#### 4.1.3. Results for frustration tolerance

Where adequate responses to frustration are concerned, the data series for Daria indicate that significant variability and level changes were obtained immediately postintervention (Table 2). The polynomial contrast computed for the baseline-intervention phases yielded a significant linear trend  $t(8) = 3.14, p < .01$ , suggesting that the intervention elicited significant changes in Daria’s frustration tolerance immediately postintervention.

For the frustration tolerance intervention in Tudor’s case, we found positive mean shifts postintervention, but the high variability in the baseline with scores as high as 100% determined the lack of changes in variability, level, or trend. In consequence, we found no evidence of the intervention’s effects on frustration tolerance strategies.

Tolerance frustration data series for Alexandru yielded significant changes in variability only in the maintenance phase, although changes in level suggested that the intervention had a low impact on these behaviors (Table 4). Moreover, there was a significant linear trend from intervention to maintenance,  $t(8) = 3.56, p < .01$ , and from the maintenance to follow-up,  $t(8) = 3.66, p < .01$ . These data suggest that the intervention was effective in the maintenance phase, and that there was another significant effect from maintenance to follow-up.

Table 3. Means, standard deviations, mean shift, variability changes, level changes and autocorrelations for observed behaviors for Tudor

	Mean (range)	Standard deviation	Mean shift	2 SD	PND	r(lag 1)
Compliance to rules						
Baseline	45.80 (37-55)	8.29				-.51*
Intervention	59.50 (54-71)	7.85	13.70	NS	25%	-.20
Maintenance	65.40 (43-75)	10.12	19.60	S	90%	.12
Follow-up	76.00 (75-77)	1.41	30.20	S	100%	-
Frustration tolerance						
Baseline	68.22 (50-100)	16.73				-.10
Intervention	72.33 (50-100)	25.42	4.11	-	-	-.39
Maintenance	80.57 (67-100)	14.06	12.35	-	-	-.33
Follow-up	87.50 (75-100)	17.68	19.28	-	-	-
Prosocial behaviors						
Baseline	28.83 (0-50)	13.71				-.17
Intervention	53.33 (50-60)	5.77	24.50	NS	33%	-.17
Maintenance	57.00 (38-67)	13.69	28.17	S	75%	-.13
Follow-up	47.50 (45-50)	5.53	18.67	NS	0%	-
Cooperative play						
Baseline	54.80 (33-100)	16.00				.17
Intervention	75.00 (50-100)	20.41	20.20	NS	-	.02
Follow-up	58.50 (50-67)	12.02	3.70	NS	-	-

#### 4.1.4. Discussion for frustration tolerance

The results for frustration tolerance indicated that the intervention for improving children’s frustration tolerance was effective for Daria and Alexandru (Figure 2). However, for Daria the intervention’s effects in terms of increased use of self-regulatory strategies were observed immediately postintervention. Usually more complex behaviors such as emotion

regulation strategies are less likely to exhibit significant changes immediately postintervention, due to the fact that they require more extensive teach and practice strategies (Sugai & Lewis, 1999). This exception seems to be related to our previous discussion about a possible interaction between the intervention for compliance and the one for improving emotion regulatory skills. This is highly possible since most of Daria's anger tantrums were associated with situations in which the teacher tried to implement strategies for reducing non-compliance and aggression. For Alexandru, the pattern of change was consistent with our predictions indicating that improved tolerance frustration was evident only in the maintenance phase. A somewhat unique aspect was identified in Alexandru's pattern of results, as there were two time points indicating the presence of a significant linear trend. Beside the linear trend from the intervention-maintenance phase, we found a significant maintenance-follow-up trend, indicating that in his case the intervention continued to exert a booster effect after the intervention ended.

Table 4. Means, standard deviations, mean shift, variability changes, level changes and autocorrelations for observed behaviors for Alexandru

	Mean (range)	Standard deviation	Mean shift	2 SD	PND	r(lag 1)
Compliance to rules						
Baseline	67.50 (50-83)	13.16				-.02
Intervention	66.75 (50-100)	23.57	-0.85	NS	25%	-.33
Maintenance	72.33 (50-100)	14.70	4.83	NS	22%	.29
Follow-up	93.33 (80-100)	11.55	25.83	NS	67%	-.67
Frustration tolerance						
Baseline	11.30 (0-50)	17.13				-.23
Intervention	19.33 (0-33)	17.21	8.03	NS	0%	-.63
Maintenance	53.14 (33-67)	12.40	41.84	S	43%	-.39
Follow-up	85.00 (75-100)	13.23	73.70	S	100%	-.64
Prosocial behaviors						
Baseline	19.00 (0-50)	15.99				-.03
Intervention	41.00 (33-50)	8.54	22.00	NS	0%	-.56
Maintenance	66.75 (50-75)	11.79	47.75	S	67%	.16
Follow-up	64.00 (45-50)	7.94	45.00	S	100%	-.29
Cooperative play						
Baseline	54.25 (13-80)	19.95				.13
Intervention	70.50 (50-85)	15.63	16.25	NS	50%	-.52
Follow-up	67.33 (60-75)	7.51	13.08	NS	0%	-.41

In the case of Tudor, the lack of significant effects can be attributed to the high variability in the baseline data, but since he scored consistently above 50% the main aim of the intervention would have been stabilizing the behavior. However, the standard deviations continued to be high throughout the intervention, suggesting that in his case the intervention did not exert significant effects. We note however, that towards the end of the intervention, Tudor was able to remain seated during the classroom activities, but most of his anger tantrums came in situations in which he refused to share toys or play adequately with other children.

Overall, our data suggest that strategies designed to enhance children's ability to deal with frustrating situations have been effective. A combination of anger management strategies for children combined with strategies derived from social learning theories such as role-play, modeling, and feedback were successful in eliciting the expected effects (Blum, 2001).

#### 4.1.5. Results for prosocial behaviors

Significant changes in variability for prosocial behaviors took place immediately postintervention, while the level changes suggested that the intervention was highly effective



only in the maintenance phase (Table 2). The baseline-intervention contrast showed that there was a significant linear trend immediately postintervention,  $t(12) = 2.66, p < .05$ , indicating that the intervention was effective for Daria.

Although we found a positive mean shift in the frequency of prosocial behaviors immediately postintervention, variability changes became significant only in the maintenance phase (Table 3). We also found a significant baseline to intervention linear trend,  $t(16) = 2.96, p < .05$ . Based on the significant linear trend we conclude that the intervention elicited the expected effects immediately postintervention. However, the intervention's effect was no longer significant at follow-up.

Alexandru's prosocial behaviors showed a positive mean shift, but significant changes in variability and moderate effects in level changes were found only in the maintenance phase (Table 4). Preplanned comparisons confirmed the presence of baseline-intervention, and intervention-maintenance linear trends,  $t(14) = 2.27, p < .05$ , and  $t(5) = 3.18, p < .05$ , respectively. These data show that the intervention elicited a two-stage change in prosocial behaviors immediately postintervention, as well as in the maintenance phase.

#### **4.1.6. Discussion for prosocial behaviors**

Prosocial behaviors as a result of the problem-solving training were significantly improved immediately postintervention (Figure 3). Again this pattern of results was inconsistent with our expectations, that children are more likely to exhibit significant improvements in their prosocial behaviors in the maintenance phase. Moreover, this effect is consistent across all our participants. One possible explanation arises regarding this effect is that emotion regulation strategies were in fact observable in terms of reduced aggression (Eisenberg et al., 1999; Roberts, 1999). Thus it is possible that the immediate effect on prosocial behaviors might be a result of lowered levels of observed aggression, and not necessarily a consequence of increased prosocial behaviors. Moreover, in the case of Alexandru we found another significant trend from intervention to maintenance, suggesting that an added effect of the intervention was obtained during the cooperative play module. The presence of a second trend is most likely an indication of the fact that the cooperative play strategies intervention affected positively the intervention's effects on prosocial skills (Marion, 2003; Sheridan et al., 1999).

On the other hand, in Tudor's case the intervention was effective and some progress in terms of toy sharing and turn-taking was obtained immediately postintervention, especially since the most important problem identified by his teacher's was that he did not allow other children to play with the toys he picked to play with. However, these effects were not longer present at follow-up. In spite of initial signs that extinction of inappropriate, aggressive behaviors was achieved, the results suggest that the intervention failed to maintain its effects. The second possible explanation is that his teachers identified as the main cause of this setback parental attitudes. Although this hypothesis might be correct, it is also very likely that preconceived ideas form the teachers' might have contributed to the same extent to the failure in increasing positive behaviors.

#### **4.1.7. Results for cooperative play**

Immediately postintervention we found that the 2SD method indicated significant variability changes in cooperative play strategies, while the PND method sustained a moderate intervention effect on Daria's group play involvement (Table 2). Also, a significant linear trend was found for the baseline to intervention phase  $t(15) = 4.01, p < .001$ , suggesting that the intervention elicited the expected effects immediately postintervention.

Cooperative play patterns did not yield any level or variability changes (Table 3). Subsequent contrasts on these data showed that there was no significant linear trend, except for a

marginally significant within baseline trend ( $p < .10$ ), suggesting that a shift in cooperative play partially occurred during the prosocial skills intervention module, however this effect on Tudor's cooperative play engagement resulting from the prosocial skills training module was not significant. Moreover, the follow-up data suggest that the frequency of cooperative play was similar to the baseline.

Cooperative play behaviors exhibited no variability and level changes (Table 4). The overall comparisons showed that there was no significant linear trend in the data ( $p > .05$ ). These results indicate that there was no significant intervention effect on Alexandru's cooperative play strategies.

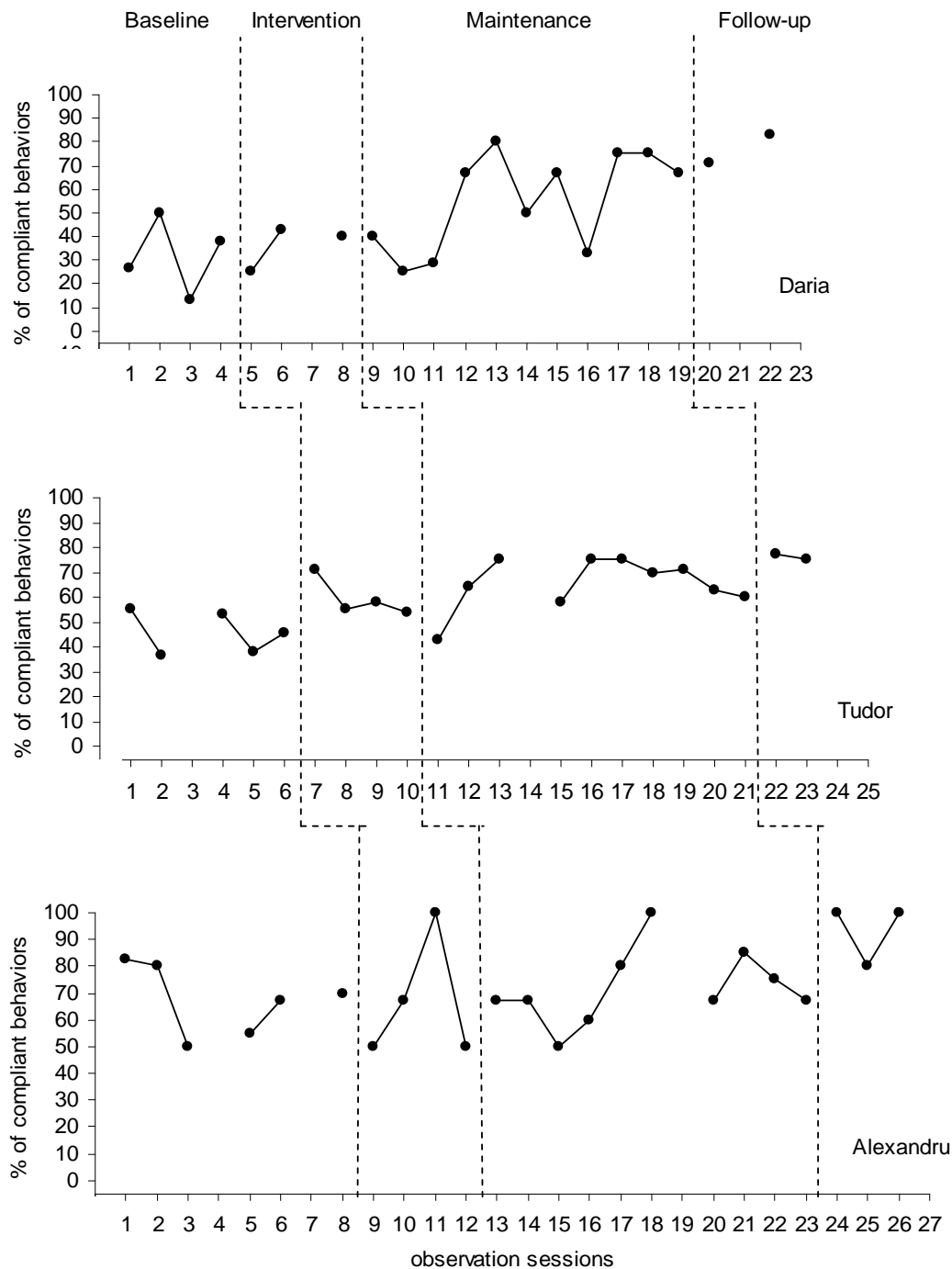


Figure 1. Observation of compliance to rules across three at risk children in a non-concurrent MBD

#### 4.1.8. Discussion for cooperative play

Regarding children's cooperative play strategies, Daria was the only participant with improved cooperative play strategies as a result of the intervention (Figure 4). Again, in her case the effect was observable immediately postintervention, which might be a consequence of the fact that improvements in her ability to deal with frustrating situations was followed by more consistent changes in prosocial behaviors and cooperative play, the latter two being highly correlated constructs (Marion, 2003; Sheridan et al., 1999). It can be said that in Daria's case the intervention followed a cascade effect beginning with the intervention module on emotion regulation.

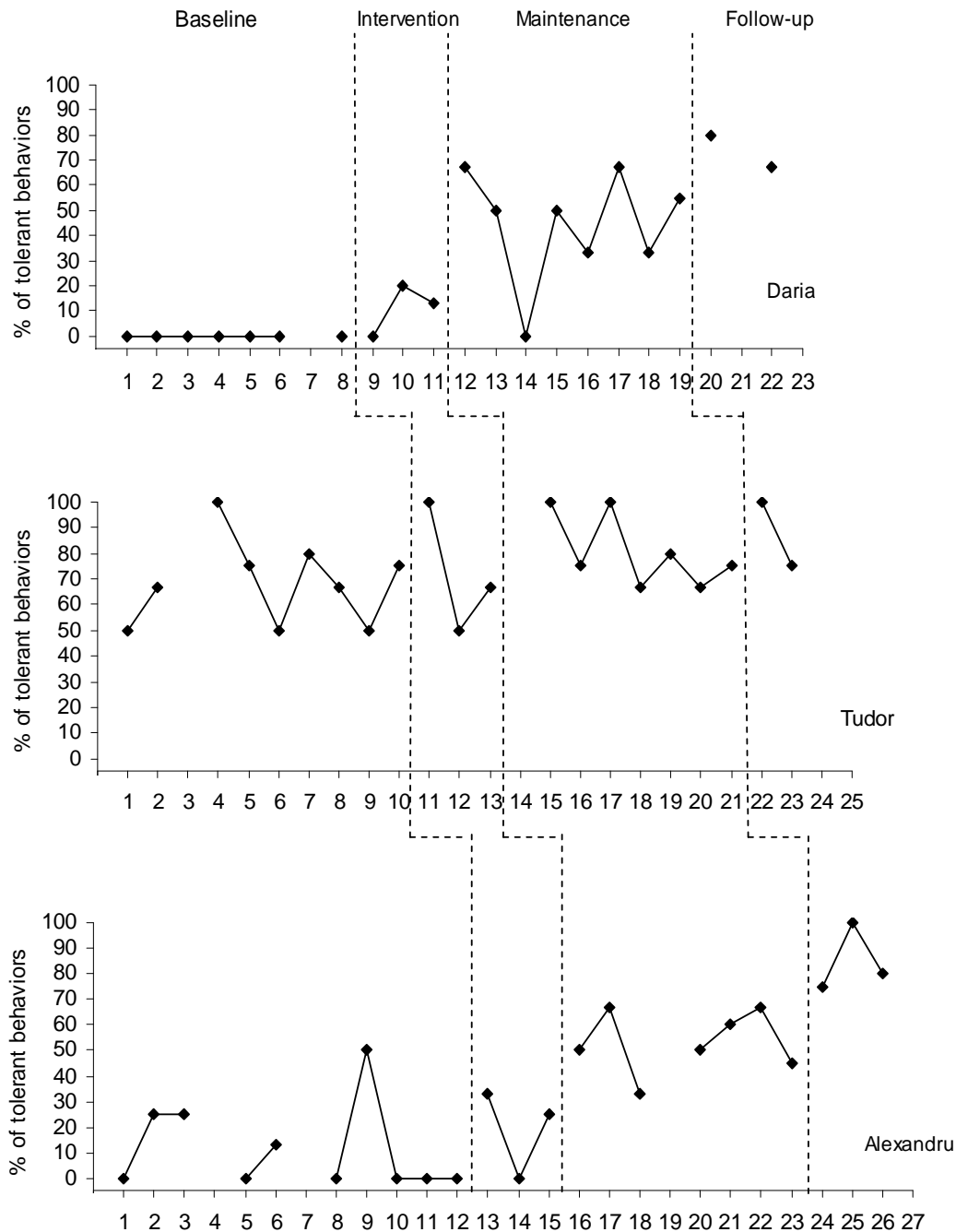


Figure 2. Observation of frustration tolerance across three at risk children in a non-concurrent MBD

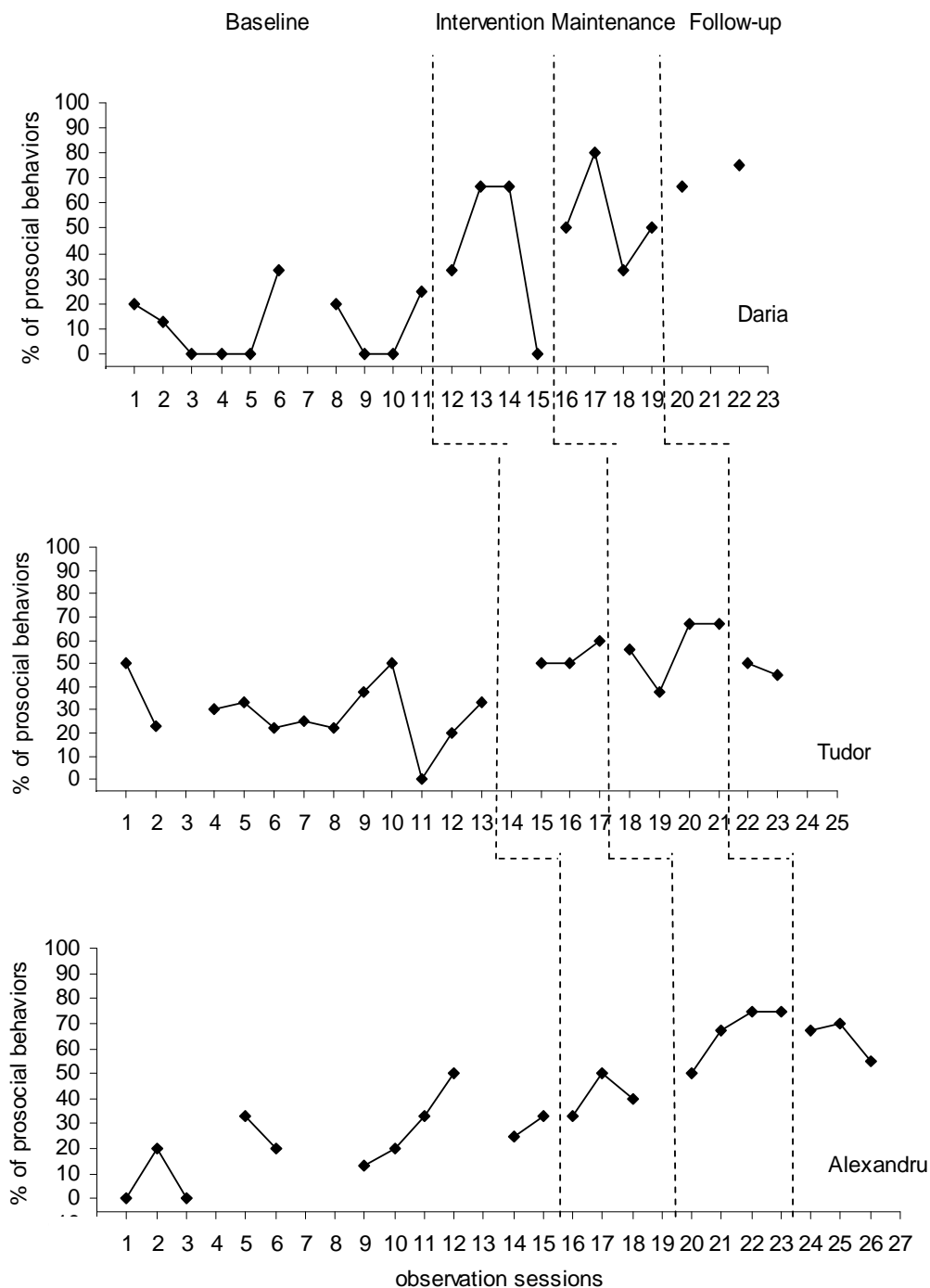


Figure 3. Observation of prosocial behaviors across three at risk children in a non-concurrent MBD

The lack of significant cooperation strategies development for Tudor and Alexandru, can be related to the fact that their baseline scores for play cooperation were consistently somewhere around 50%. This would indicate that there might be a “ceiling” effect, which prevented the intervention from eliciting the expected behavior changes. In the case of Tudor a marginally significant trend was detected for play cooperation immediately after the intervention induced significant improvements on prosocial behaviors, which might be a consequence of the booster effect that these behaviors have on cooperative play (Marion, 2003).

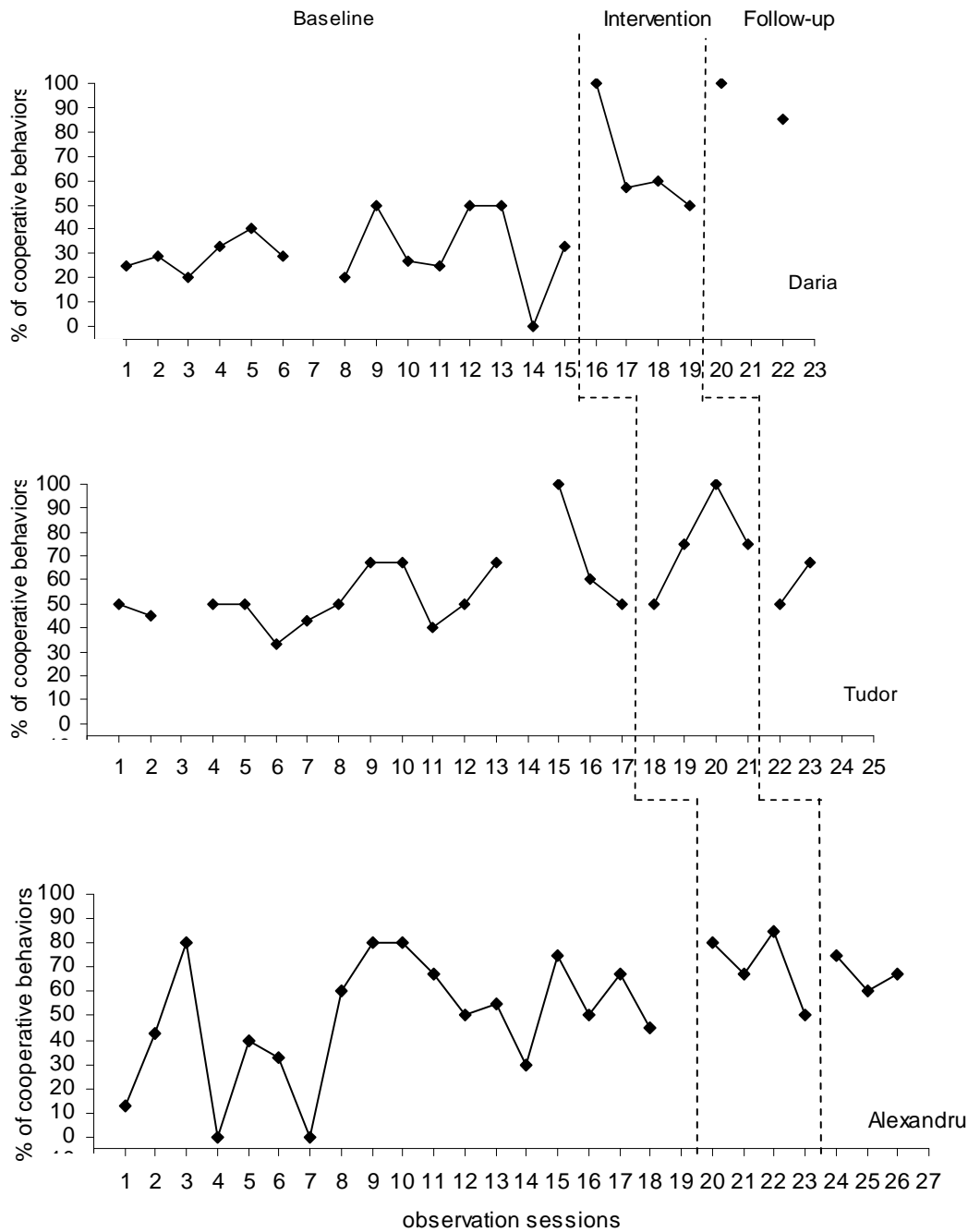


Figure 4. Observation of cooperative play behaviors across three at risk children in a non-concurrent MBD

Unfortunately, as previously pointed out these positive effects of the intervention were not converted in adequate long-term outcomes. A possible combination of both teacher and parental inappropriate attitudes might have been responsible for the lack of effects. In the case of Alexandru, the lack of effects can be explained by the teacher's initial perceptions "He is a shy child, and although he has a few friends, he invites them to play occasionally". It could be said that in his case the improvements were rather qualitative as opposed to quantitative: "I do not think he plays with other children more often, but I see that he shares more, and he has learned some strategies to join other children's play". This explanation is supported by empirical data suggesting that some children's inhibited temperamental predispositions might moderate their use of cooperative play strategies (Blair, Denham, Kochanoff, & Whipple, 2005; Eisenberg et al., 2000).

## 4.2. Results and discussion for parent discipline strategies

### 4.2.1. Results for parent discipline strategies

Data on parenting practices for Daria's mother reflected the lack of changes in variability and level for the use of praise (Table 5). In spite of these results neither the overall, nor the specific contrasts indicated the presence of a significant linear trend ( $p$ 's > .05). Therefore, we found no significant changes in the frequency of praising. We were also interested in measuring the intervention's effects on the frequency of positive discipline strategies. There were no significant postintervention changes in either variability or level (Table 5). However, we found a significant linear trend in the maintenance phase,  $t(5) = 3.46$ ,  $p < .05$ . The results indicate that the intervention elicited significant effects in the maintenance phase.

Table 5. Means, standard deviations, mean shift, variability changes, level changes and autocorrelations for parental self-monitoring for Daria's mother

	Mean (range)	Standard deviation	Mean shift	2 SD	PND	r(lag 1)
Praise for adequate behaviors						
Baseline	85.00 (70-100)	15.00				.01
Intervention	79.00 (67-90)	11.53	- 6.00	-	33%	-.05
Maintenance	85.43 (70-100)	11.21	0.43	-	29%	.01
Follow-up	90.00 (80-100)	14.14	5.00	-	50%	-
Positive discipline for inadequate behaviors						
Baseline	50.00 (33-67)	11.21				-.73*
Intervention	58.00 (50-67)	7.26	8.00	NS	0%	-.67
Maintenance	74.33 (70-78)	4.04	24.33	S	100%	-.41
Follow-up	68.50 (67-70)	2.12	18.50	NS	50%	-

The changes in the frequency of praise for Tudor's mother were found in the maintenance phase. The 2SD method indicated significant changes in variability, while the PND suggested a moderate effect of the intervention (Table 6). We conducted preplanned contrasts on the data series, as well as the baseline-intervention scores, but the analysis yielded no significant linear trends in the data ( $p$ 's > .05). Based on these findings the intervention was effective in eliciting higher frequency in the use of praise in the maintenance phase.

Positive discipline strategies followed the same pattern in terms of variability and level changes as the use of praise (Table 6). Unlike the case of praise, the preplanned contrasts indicated that there was a significant baseline-intervention linear trend,  $t(7) = 2.74$ ,  $p < .05$ . The presence of a significant linear trend indicated that the intervention was effective immediately postintervention. However, for the parental attitudes towards discipline, we have no follow-up data, which would make possible conclusions regarding the maintenance of the intervention's effects.

The data on the use of praise for Alexandru's mother, show a positive mean shift immediately postintervention, but significant variability changes, as well as moderate level changes occurred only in the maintenance phase (Table 7). However, we found no significant linear trend ( $p > .05$ ). The data showed that the intervention had a significant effect on parental praise in the maintenance phase, and the intervention effects were stable in the follow-up phase.

For positive discipline strategies, we obtained a positive mean shift across the intervention phases, but no significant changes in variability and level except for the follow-up phase (Table 7). However, the preplanned comparisons indicated that there was no significant linear trend in the data ( $p > .05$ ). The results suggest that a significant change in the use of positive discipline occurred at follow-up, but not as a direct result of the intervention.

Table 6. Means, standard deviations, mean shift, variability changes, level changes and autocorrelations for parental self-monitoring for Tudor's mother

	Mean (range)	Standard deviation	Mean shift	2 SD	PND	r(lag 1)
Praise for adequate behaviors						
Baseline	47.33 (40-57)	8.74				-.04
Intervention	55.00 (50-60)	5.00	8.67	NS	33%	-.50
Maintenance	63.67 (50-75)	9.42	16.34	S	67%	-.40
Follow-up	-	-	-	-	-	-
Positive discipline for inadequate behaviors						
Baseline	38.50 (33-50)	6.28				-.39
Intervention	50.00 (45-55)	5.00	11.50	NS	33%	.00
Maintenance	53.33 (38-67)	14.57	14.83	S	67%	-.01
Follow-up	-	-	-	-	-	-

#### 4.2.1. Discussion for parent discipline strategies

All parents significantly improved their rates of praise delivery with the exception of Daria's mother whose baseline scores were above 80% (Figure 5). Moreover, it is interesting that in spite of not attending the required intervention dosage, Tudor's mother exhibited significantly higher percentages of praise use. This might be a consequence of the fact that she attended the first two intervention sessions, which would explain the presence of this effect since the second module targeted the use of praise and rewards as means of motivating children's positive behaviors.

Table 7. Means, standard deviations, mean shift, variability changes, level changes and autocorrelations for parental self-monitoring for Alexandru's mother

	Mean (range)	Standard deviation	Mean shift	2 SD	PND	r(lag 1)
Praise for adequate behaviors						
Baseline	68.67 (60-75)	7.77				-.62
Intervention	86.67 (70-100)	15.28	18.00	NS	67%	-.48
Maintenance	87.71 (75-100)	9.57	19.04	S	86%	-.58*
Follow-up	90.00 (80-100)	14.14	21.33	NS	100%	-
Positive discipline for inadequate behaviors						
Baseline	44.33 (35-55)	7.42				.26
Intervention	51.67 (45-60)	7.64	7.34	NS	33%	.10
Maintenance	53.00 (45-67)	9.63	8.67	NS	25%	-.47
Follow-up	71.00 (67-75)	5.66	26.67	S	100%	-

A second observation was that the parents exhibit significant trends in their use of praise in the maintenance phase. An interesting explanation of this delayed effect was drawn from the self-monitoring exercise. The self-monitoring sheets revealed that all parents appreciate largely the same categories of behaviors: playing nicely with other children, gathering toys, finishing activities without asking for help, responding promptly when asked to do something, complying to rules without reminders (e.g., going to bed without complaining, washing teeth, putting on pajamas alone, etc.). However, there were some qualitative differences between these parents such as a tendency to report more positive behaviors immediately postintervention, as well as appreciating different types of behaviors (e.g., autonomy related, greeting other people).

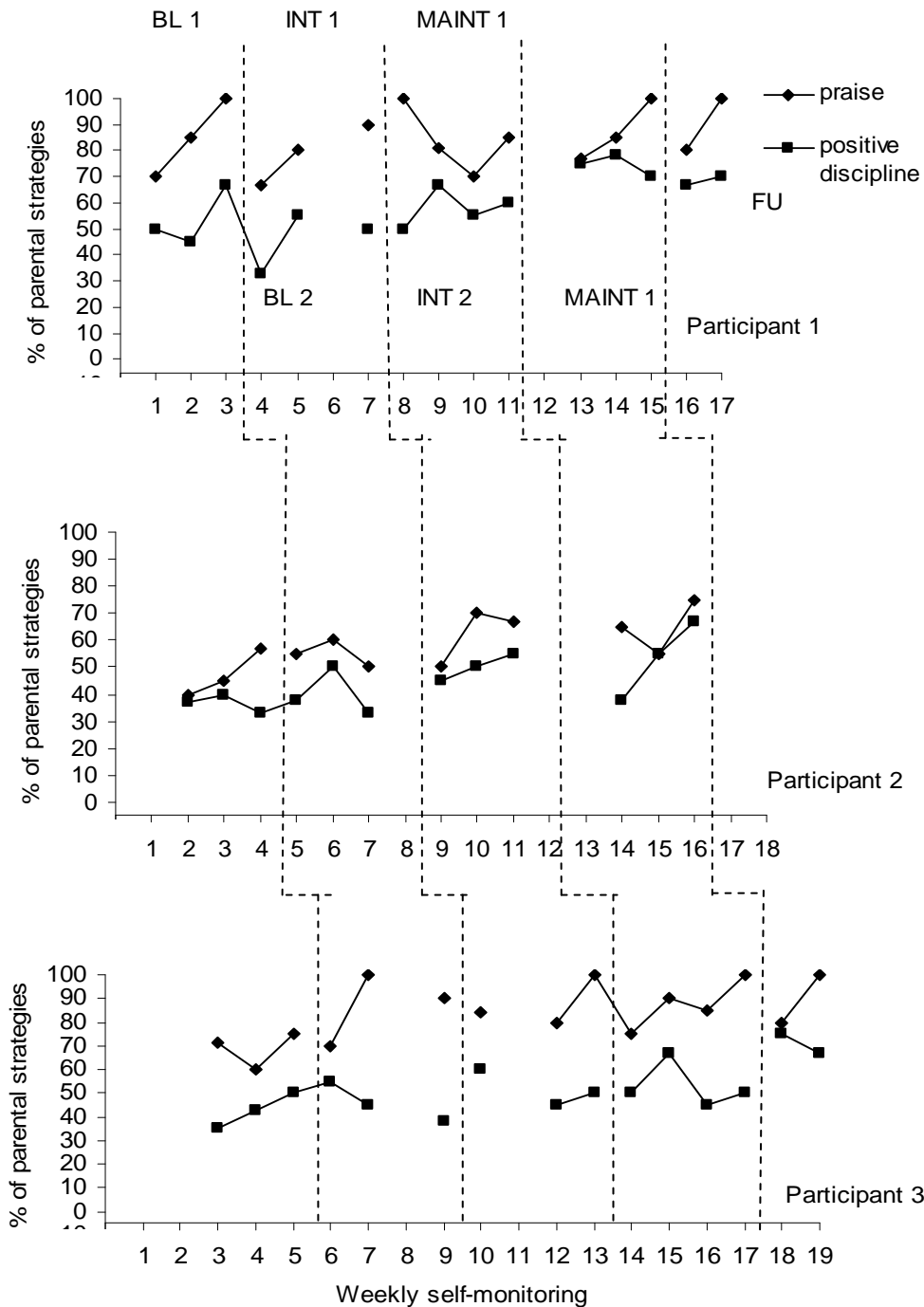


Figure 5. Self-monitoring of praise and positive discipline strategies across three at risk parents in a non-concurrent MBD

The second self-monitoring exercise concerned the use of positive discipline strategies for dealing with children's inappropriate behaviors. Interestingly, the intervention's effects occurred immediately postintervention. One possible explanation could be related to the order of discussing and exercising praise and positive discipline strategies. More precisely we targeted increased use of positive attention, praise and rewards, while dealing with response cost procedures in the consecutive intervention module. Taking into account that parents are more sensitive to their children's misbehaviors, which are more salient (Baldwin & Sinclair, 1996; Chamberlain & Patterson, 1995), our aim was to prevent excessive focus on negative behaviors which is most often counterproductive (Conoley et al., 2003).



In the case of Daria's mother the effects of the intervention can be explained by her participation to added individual training and the fact the monitoring sheet revealed high baselines regarding the use of praise and consistency. In this context the reduction in parental mild spanking explains the presence of less recordings of child aggression, and fewer entries regarding non-compliance and anger tantrums.

In spite of attending only half of the group training sessions, Tudor's mother reported significant changes in terms of increased positive discipline strategies. One possible explanation is that the parent may have had access to the handouts of the last two training sessions which could be handed out by the teachers at the parents' request. A second possibility is that the recordings might not provide a correct estimate of changes in parental attitudes, since this parent might have misreported some of the data in order to promote a socially desirable perception about her abilities (Critchfield, Tucker, & Vuchinich, 1998; Peterson & Tremblay, 1999).

For Alexandru's mother, the data from the self-monitoring exercise indicate that the parent used more frequently logical consequences and ignoring of attention-seeking behaviors, however these differences were not significant. A possible explanation for the lack of observed effects could be related to the presence of two parental risk factors, as separate data for harsh and inconsistent discipline strategies were not treated separately. In consequence, parents might need more time in order to exhibit significant changes in parenting attitudes, especially when dealing with high rates of misbehaviors. The presence of follow-up significant improvements would give credit to this interpretation.

#### **4.3. Results and discussion of teacher and parent ratings**

It is noteworthy that teachers' ratings did not differentiate between the children, as they all received moderate risk ratings for their competencies development and above cut-off scores on externalizing problems immediately postintervention. It is possible that the questionnaire ratings are influenced by the level of teacher involvement with the intervention, coupled with their positive overall perception about the benefits of the intervention (e.g., "all of the children have made a progress in their behavior", "I am proud that they know the rules, and they have learned to be responsible about them", or "I was skeptical that so much can change in a few months, but now they play nicely with each other and we do not have to deal so much with conflicts"). In turn, this might lead to overestimate some children's progress as it is the case of Tudor.

Parents' preintervention evaluations on their children's competencies were consistently higher than those obtained from the teacher assessments. One possibility is that parents' and teachers' evaluations of non-clinically referred children are dissimilar (Achenbach et al., 2002). The other is that parents do not have the same opportunities to compare their children's abilities to others, something which is more likely to occur in the classroom. In either case, parents evaluated all children as having better developed competencies and below cut-off scores for externalizing problems, except for Alexandru. We note however, the below 50% reductions in the frequency of negative behaviors was obtained for children whose parents attended the intervention. This confirms our assumption that generalization of skills acquired in the classroom is highly related to the parental ability to support these acquired skills at home.

Moreover, the reduction in children's negative behaviors (Daria and Alexandru) is more consistently associated with below cut-off scores on harsh and/or inconsistent parenting strategies. These data indirectly confirm that in fact children's inadequate behaviors are maintained by inappropriate parental discipline strategies (Bradley & Corwyn, 2007; Cole et al., 2003).

Self-ratings from the questionnaire and the self-monitoring exercise were consistent for Daria's and Alexandru's mothers. The exception was Tudor's mother and possible explanations have been already discussed in the previous section on parental self-monitoring.

## 5. CONCLUSIONS

Studies 3 and 4 are among the few to evaluate the effects of an indicated intervention on children's observed classroom behaviors. In a domain that has been addressing mostly evidence-based interventions for clinically referred children, our attempt is among the first to address issues regarding children at risk for early onset conduct problems. Confirming our expectations, similar strategies that induce changes in clinically-referred children proved efficient for most of the at risk children, except for the cases in which baseline scores were consistently around or above 50%.

The second observation is that most of the behaviors targeted by the program to not improve immediately postintervention, but rather in the maintenance phase. This supported the notion that changes in the classroom occur in time, especially for more complex behaviors which rely on repeated practice and reinforcement of appropriate behaviors (Gimpel & Merrel, 1998). The presence of immediate postintervention changes is most often related to carry-over effects between intervention modules. For example, we assumed that compliance is the first step in the intervention, because higher compliance rates have been associated with children's improved abilities to regulate emotions (Stifter et al., 1999). Also, emotion regulation strategies require that children possess the adequate emotion knowledge (Eisenberg, Sadovsky, & Spinrad, 2005). Furthermore, emotion regulation abilities sustain problem-solving and provide means of preventing aggressive behaviors (Romano, Tremblay, Boulerice, & Swisher, 2005). In turn, the development of prosocial behaviors sustains the process of acquiring cooperative play strategies (Sheridan et al., 2003).

The data from the self-monitoring exercise in Study 4 have provided important insights into changes in parental behaviors, but also allowed us to make some qualitative interpretations regarding parents' perceptions of children's positive and negative behaviors. First, our data suggest that developing parents' ability to monitor children's positive behaviors and their progress is essential for obtaining adequate use of positive parenting strategies. Second, irrespective of the number of risk factors (child, or child and parent), it is important to note that parent attendance is critical for obtaining a 50% reduction in children's externalizing problems. Although there are recognized limitations of self-monitoring mostly associated with social desirability, most researchers argue that self-monitoring might actually be more reliable than self-ratings (Toney, Kelley, & Lanclos, 2003), since self-monitoring of a particular behavior might result in detecting significant intervention effects, whereas global evaluations are less likely to be sensitive to such changes.

Although changes in baseline trends are considered threats to the internal validity of the MBD (Christ, 2007), we consider this as a limitation inherent to this type of study. From a methodological point of view, a more precise answer to this problem can be achieved by using a "latin square" design, which counterbalances the order of intervention strategies (Carr, 2005). However, such an approach is difficult to implement because the rationale behind the order of the intervention modules. Evaluating the outcomes of such an intervention would be difficult because these behaviors are to some extent related and the logic of the intervention draws on empirical data.

Another methodological limitation of this study is that it employed a non-concurrent MBD for assessing the intervention's effect. The limited capacity to make inferences is related to the fact that subjects do not serve as each others controls and the generalization of these results is thus limited. This was accepted, mostly due to the need for compromise between methodological rigor and applied research (Christ, 2007). The first reason for our choice was the fact that children became available for our study at different times, which usually happens in real practice settings (Carr, 2005). Second, the duration of the intervention makes long baselines more permeable to time related changes, making staggered interventions characteristic for concurrent MBD a less attractive option.

One of the main findings of this study is that teacher ratings, although highly related to independent observations (Hinshaw et al., 1992), do not accurately predict children's behavior changes. More precisely, there is a tendency to report changes, even when observation methods show that significant increases do not occur. Based on our results we are tempted to conclude that in some cases teacher ratings are subject to biased perceptions, especially when they have been involved in the intervention.

## CHAPTER 4. FINAL CONCLUSIONS

### Contributions to the field of early education

The aim of the four studies included in this thesis was to evaluate the efficiency of a multifocused early education program targeting preschool children's emotional and social development, as well as the reduction of externalizing problems. We employed two major methodological approaches in our validation studies: 1) partially randomized clinical studies; and 2) single subject experiment. These allowed us on one hand to evaluate the intervention's efficiency by comparing its effects on an intervention group compared to a control group (a nomothetic approach), which allows population level inferences, and on the other hand analyzing the intervention's effects at the individual level (an idiographic approach), which facilitates the understanding of underlying mechanisms involved in implementing the intervention strategies. In the following section, we aim to establish the impact of these studies from theoretical, methodological, and empirical evidence perspective in the field of early education (Table 1).

Drawing on successful prevention approaches and empirically supported intervention strategies, we opted for the development of a multifocused prevention program targeting child, parent, and teacher risk. However, we adjusted this intervention model according to empirical evidence suggesting that differential approaches between high risk and low risk children, and their parents might be detrimental to the implementation quality (Roberts, Mazzuchelli, Studman, & Sanders, 2006; Turner & Sanders, 2006). To our knowledge results from Studies 1 and 2 are the first to confirm the sustainability of a hybrid intervention model, which proposes a similar content for both the universal and indicated level of intervention, but assumes different intervention mechanisms. Moreover, these studies are the first to employ a screening of children's competencies at this age in order to establish risk status (Durlak & Wells, 1998).

The results from Study 1 and 2 differentiate the outcomes of the intervention regarding children's behaviors in the classroom and at home. According to the data concerning the classroom effects, most consistent gains in terms of increased skill development and lower levels of externalizing problems took place as expected for high risk children. The universal intervention seemed to have elicited the most consistent effects for the moderate risk group, indicating that in fact previous reports of these interventions' lack of effects could be accounted for by the fact that a subcategory of marginally at risk children was overlooked (Stoolmiller et al., 2001). Also, data from Studies 1 and 2 suggest that the patterns of risk established based on the separate screening for emotional and social competencies development indicate that these constructs are independent and that especially for high risk children improved emotional competence seems to take longer to convert into improved social competencies.

For studies Studies 3 and 4, we chose to test the efficacy of the indicated intervention level for high risk children, and high risk children and their parents. The single-subject designs were traditionally used for determining the efficiency of interventions for clinically referred children (Gmeider & Kratochwill, 1998; Fenstermacher et al., 2006; Loftin et al., 2008), and applying such methods for testing indicated prevention programs constitutes somewhat of a new approach.

Table 1. Theoretical, methodological, and empirical evidence contributions

<b>Contributions of the four efficacy studies for the prevention of early onset conduct problems</b>	
<b>Theoretical</b>	
- construct definitions	- proposing a revised model of interaction between child, parent, and educational environment risk factors - differentiating and defining constructs of emotional and social competencies for preschool children
- intervention program development based on the theoretical background	- developing the first multifocused (children, teachers, parents) early education program in Romania - adapting the hybrid universal and indicated intervention model for community-based interventions <b>a. child-focused program</b> - supporting high risk children through teacher training, instead of added child training <b>b. teacher training</b> - providing consultations and support for teachers in implementing the program <b>c. parent training</b> - combining information providing strategies with discipline strategies and coaching for children's emotional and social development / delivering a short 4-session format training
<b>Methodological</b>	Partially randomized trial
	Single-subject studies
	- using a two-stage screening method for identifying at risk preschool children - differentiating between the moderate vs. low risk children as target groups of the universal intervention - revising the AKT (Denham, 1986) to include relevant ecological stimuli
	- using single-subject design methodology for testing the efficacy of the intervention on high risk children, not clinically-referred children - developing observation tools for children's classroom behaviors - implementing self-monitoring as both a data gathering and an intervention strategy
<b>Results</b>	
	- providing evidence for the sustainability of a single intervention program for both universal and indicated intervention purposes - effects on high risk children's externalizing problems without added pullout sessions - short parent trainings can sustain children's skill transfer - providing comparative analysis based on three risk categories - high risk children benefit to the largest extent (except for parent interventions where moderate risk children are the most likely to benefit) - moderate risk children make the most consistent gains (universal intervention) - providing comparative analysis on emotional and social competencies separately – for high risk children emotional competencies take longer to convert in social competencies
	- supporting the notion that classroom interventions are effective in eliciting changes in high risk children's behaviors (the effects are observable in the maintenance phase and indicate the presence of carry-over effects between intervention modules) - teacher ratings overestimate changes in children's classroom behaviors - providing both quantitative and qualitative indices of changes in parental attitudes - emphasizing the role of positive attention as prerequisite for increased use of positive discipline strategies - supporting the notion that parental involvement is essential for reducing the levels of children's negative behaviors irrespective of the number of risk factors

The obtained results refined some of the data from the group comparisons in terms of indicating that teacher assessments tend to overestimate the intervention's effects for children who actually do not show significant gains in their competencies. However, a relevant finding is that changes in children's competencies are mostly induced by the use of coaching strategies, and the teachers' willingness to further implement them after the intervention ended. Environments that provide children with optimal educational experiences, based on positive,

constructive teacher-child relationship, allow children to add adequate strategies to their behavioral repertoire (Birch & Ladd, 1997; Erden & Wolfgang, 2004).

Also, data from these studies indicate that parental involvement constitutes a booster effect for the intervention, independent of whether parents exhibit risk factors. This in fact supports the notion that parents are paramount for the success on any intervention strategy for this age category and more specifically for children at risk. Data from Study 4 on parental discipline strategies were gathered using a self-monitoring technique. Although it can be viewed as a less objective method than behavior observation, this strategy constitutes an interesting source of both quantitative, as well as qualitative data. Moreover, some quantitative changes seem to be predicted by qualitative changes in terms of increased positive behaviors observed by the parents. Also, our data sustain that changes in positive discipline might be more easily achieved when positive behaviors are reinforced.

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