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Effectiveness of a Universal School-Based Social Competence Program: The Role of Child Characteristics and Economic Factors

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An evaluation of the effectiveness of a school-based social competence curriculum PATHS (Promoting Alternative Thinking Strategies) on teacher-rated aggressive behavior, ADHD, and prosocial behavior in children. The one-year prevention program was administered to children in 28 of 56 Swiss elementary schools (N = 1,675). Outcomes were assessed at pretest and posttest with a follow-up 2 years later. Moderator interactions involving baseline child characteristics and economic factors were tested. There were significant treatment effects for ADHD/impulsivity and aggression at the follow-up. Baseline development variables predicted higher prosocial behavior as well as lower aggressive behavior and ADHD at the follow-up. Economic risk factors predicted poor behavior outcomes at the follow-up. Development variables moderated the impact of PATHS on ADHD and aggression at the follow-up. However, for most outcomes, no main effects or moderation of treatment effects were found.

Developmental scientists have noted the interaction between child characteristics and ecological conditions in the development of psychopathology and social competence (Bronfenbrenner and Evans 2000). The need to prevent children's mental health problems is broadly acknowledged as well, and a number of school-based curricula have been designed to prevent the development of problem behaviors and mental disorders such as aggression and ADHD. Meta-analyses of school-based aggression intervention programs indicate that programs that focus on the promotion of social skills reduce aggressive behavior and mental health problems (Hahn et al. 2007). What is missing are dissemination trials by researchers evaluating these programs independently of the program developers, using rigorous methodological designs and implementing the program "as marketed" (Eisner, Malti, and Ribeaud 2011). Additionally, relatively few large-scale studies have investigated the moderating role of child characteristics at baseline and economic factors in determining program outcomes, and most of the existing studies were conducted in the United States. We therefore examined how certain child characteristics (baseline behavior, initial social-cognitive development, initial emotional development) and socioeconomic and demographic factors (socioeconomic status, financial problems, single-parent household) can moderate the impact of a universal intervention.

1. The Intervention

Our study employed PATHS (Promoting Alternative Thinking Strategies), which is a school-based universal intervention program that is widely reported to reduce mental health problems and improve social competence in primary-school children (Greenberg and Kusché 2002). It was chosen because it is evidence-based and was assessed positively in a feasibility study conducted in collaboration with the school authorities of the City of Zurich, Switzerland (Eisner et al. 2011).

PATHS relies on an integrative model of children's risk-and-resiliency development. The underlying assumption is that

Trial registry name: The Zurich Project on the Social Development of Children and Youth. Identification number: ISRCTN84472990.

the promotion of various aspects of social development helps to reduce a set of well-known risk factors for aggression (Greenberg et al. 2003). These risk factors include poor social-cognitive skills (Crick and Dodge 1996), poor emotional skills (Arsenio, Gold, and Adams 2006), and poor inhibition control (Riggs et al. 2006). To reduce these risks, the PATHS lessons promote social-cognitive development, positive social behavior, and understanding of emotions. PATHS is one of only eleven programs recommended as effective by Blueprints of Violence Prevention at the University of Colorado (Greenberg and Kusché 2002). Several rigorous trials of PATHS have been undertaken (Conduct Problems Prevention Research Group 2002; Riggs et al. 2006). Taken together, these trials show that PATHS has a strong evidential base. However, in contrast to the present study, most of these evaluations were supervised by the developer of the program and were conducted in the United States.

2. Moderators of Program Impact

There is emerging evidence that children at high risk for behavior problems are the most likely to benefit from school-based interventions. For example, two large-scale prevention projects for aggressive elementary grade school children achieved long-term reduction in antisocial behavior with their interventions, which included social competence training (Conduct Problems Prevention Research Group 2002, Conduct Problems Prevention Research Group and Dodge 2007). The MACS (2002) study, which included universal school-based prevention programs plus an intensive intervention for students with high levels of initial aggression, showed reduction of aggressive behavior. Because of this evidence that intervention outcomes are moderated by initial behavioral risk, the present study included the child's initial behavior as a moderator of intervention effects.

Contemporary research on the prevention of aggressive behavior also emphasizes the importance of social-cognitive and emotional development in reducing aggression. For example, studies have shown that social-cognitive problems and lack of emotional skills predict increased levels of aggression over time (Lansford et al. 2006). This research, combined with the PATHS approach to promoting improvement in social-cognitive development and emotional literacy, makes it necessary to explore the possible moderation of social competence interventions by initial social-cognitive and emotional development. The present study therefore included two indicators of social-cognitive and emotional development: social problem-solving and moral emotions. These domains were chosen because children's social problem-solving is related to aggressive behavior (Orobio de Castro et al. 2002). Likewise, emotions about moral conflicts (i.e., emotions that children attribute to an actor as a consequence of aggression) have been shown to reduce aggression (Arsenio et al. 2006; Malti and Krettenauer 2012). To the best of our knowledge, no independent, large-scale randomized controlled trial of PATHS has investigated this possible moderation of behavioral, social-cognitive, and emotional development in children.

In addition, it is necessary to examine economic factors as possible moderator variables. Research suggests that up to 25 percent of children living in economic hardship have negative mental health outcomes (Costello et al. 1996; Keenan et al. 1997). It is thus important to understand whether the effectiveness of a given intervention varies as a function of the socio-economic background of the children.

3. The Present Study

Our study was designed to compare the effectiveness of the PATHS program to a control group using a factorial design with a post-test and two-year post-intervention follow-up. We tested moderators of program effects (child characteristics and economic factors). We predicted that children in the treatment (PATHS) condition would manifest greater reductions in aggressive behavior and ADHD/impulsivity, and greater increases in prosocial behavior, than children in the control condition. Based on the results of previous randomized controlled trials of PATHS in the United States, we hypothesized that the reduction in aggressive behavior and ADHD would be greatest among children showing the highest levels of aggressive behavior and ADHD at the beginning of the study. In addition, we expected that child characteristics (social-cognitive skills and moral emotions) as well as economic factors would play a moderating role in the effectiveness of the PATHS intervention. Socioeconomic status, occurrence of financial difficulties, and single parent households were used to represent economic risk. Based on related research in the

United States, we expected that children with higher economic risk would benefit more from the intervention (e.g., Raver et al. 2009). Given that longitudinal and intervention research has consistently identified the importance of gender, nationality, and special-needs education as predictors for the outcomes of interest (Raver et al. 2009), we controlled for these variables.

The present study aimed at analyzing moderators of treatment effects (baseline characteristics associated with variation in the achieved intervention effect) because understanding the active components of intervention trials is important for informing future intervention research. An analysis of moderators helps to understand whether some children benefit more or less from the intervention (Gardner et al. 2010; Hinshaw 2002). This is important, because it can spur further research on targeted interventions that match the needs of particular subgroups.

3.1. Method

3.1.1. Participants

The data were drawn from the Zurich Project on the Social Development of Children (z-proso), which is an ongoing prospective longitudinal study (for a detailed overview, see Eisner et al. 2011). For sampling, we used a cluster-randomized approach with the school as the unit of randomization (see Malti, Ribeaud, and Eisner 2011). Two universal prevention programs, one-school-based (PATHS) and the other family-based (Triple-P), were compared in a factorial design with schools randomly assigned to one of four treatment conditions (PATHS only, Triple-P only, PATHS and Triple-P, control). The sample at Time 1 (T1) consisted of 1,675 first graders (48 percent girls; mean age 7.0 years, $SD = 0.42$; see Malti et al. 2011, for response rates across data waves).

3.1.2. Intervention

The version of PATHS used in the present study was the same as that used in the Fast Track Project during the second school year (Bierman et al. 2010). It is a one-year program that includes forty-six primary lessons. The content, methods, and materials were culturally adapted to the Swiss school system, and the materials were tested in a pilot study (Eisner et al. 2011). PATHS lessons address problem-solving skills, social relationships, self-regulation, rule understanding, emotion understanding, and positive self-esteem. The classes were taught for 67 minutes per week. The teachers who implemented PATHS attended a two-day training course prior to the start of the experimental sessions. The five coaches were trained and supervised by an experienced Dutch expert who also manages the PATHS teacher-training institute in the Netherlands. To increase implementation quality, the coaches visited each class four to six times during the implementation period, after which they discussed the lesson with the teacher and provided feedback. A refresher seminar was held midterm, and regular PATHS newsletters helped to create a sense of cohesion among the teachers. Zurich city council made the PATHS curriculum compulsory for teachers in the intervention group. The procedures used to monitor implementation closely followed methods described by Greenberg and Kusché (2002) and included teacher and child questionnaires in addition to observations by the coach. The overall implementation quality was evaluated as high (Eisner et al. 2011).

3.2. Variables

3.2.1. Dependent Variables

As dependent variables, we assessed teacher-reported aggressive behavior, ADHD, and prosocial behavior. In the z-proso study, behavior outcomes were assessed according to reports by teachers, parents, and children (Eisner et al. 2012; Malti et al. 2011). However, in the present analysis we focus on teacher-assessed outcomes only because treatment effects of a school-based intervention are most likely to be observed in the school context and we have shown elsewhere that the main effects were very limited, and mostly occurred in the teacher-rated data at follow-up (Malti et al. 2011). Furthermore, we have documented elsewhere that the PATHS plus Triple-P treatment does not have any stronger effects on externalizing behaviors than PATHS alone (Malti et al. 2011).

All outcomes were rated by the teachers at T1–T4 using the Social Behavior Questionnaire (SBQ) (Tremblay et al. 1991). The Zurich school system requires that children remain in the same class with the same teacher from the first to the third grade, but they enter new classes in the fourth grade; thus, all the teacher assessments at T4 were made by

new teachers who were blind as to treatment condition. The items in the teacher questionnaire were assessed on a five-point Likert scale. For aggressive behavior, eleven items were assessed. The average reliability (Cronbach's α) across the four waves was .93. For ADHD, eight items of the SBQ were used. The average for the ADHD scale was .91. For prosocial behavior, the SBQ subscale contained seven items. Across the four waves, α was .92.

3.2.2. Moderator Variables: Child Characteristics

The following moderator variables representing child characteristics were assessed: social-cognitive skills, moral emotions, and baseline behavior (aggression, ADHD, prosocial behavior).

Social-cognitive skills. The children's social-cognitive skills were measured before the intervention by having them respond to four hypothetical vignettes: playing on a swing, participating in a game, laughing at someone, and stealing a ball. These four scenarios were adapted from previous research (Crick and Dodge 1996). After the child had been read the respective story text, he or she was asked for his or her problem solution strategies (e.g., "What could you say or do so that you could play on the swing?"). The responses were audiotaped and later coded in the following categories: (a) aggressive strategies (e.g., "I'd just push him off the swing"); (b) socially competent strategies (e.g., "I'll ask to take turns"); and (c) other strategies. Two independent coders rated the total content of all the transcripts. The inter-rater agreement (Krippendorff's α) across the categories was .80 (Krippendorff 1978). Proportional mean scores for aggressive and socially competent problem-solving strategies were then calculated.

Moral emotions. The children's moral emotions before the intervention were measured by a revised version of the original happy-victimizer task, which has been widely validated in the developmental literature (e.g., Malti et al. 2009). The children responded to four hypothetical rule violations and were asked to attribute emotion to self-as-victimizer ("How would you feel afterwards if you had done this? Why?"). Self-attributed emotions were coded on a four-point Likert scale from 1 (very good) to 4 (very bad). The four scores were aggregated across stories (α = .67), and the scale was labeled "moral emotions." Because the final score was skewed, it was log transformed.

3.2.3. Moderator Variables: Economic Factors

As economic moderator variables, we assessed household socioeconomic status (SES), financial difficulties, and single- versus two-parent household. SES was defined by coding the caregiver's current profession; the codes were then transformed into an International Socio-Economic Index (ISEI) occupational-status score (Ganzeboom et al. 1992). The final SES score was a derivative of the highest ISEI score of the two caregivers. Financial problems were assessed in the parental interview at T1. The parents were asked if they had experienced periods of financial difficulty resulting in arrears in payment of household bills during the last year. Household composition was assessed in the parental interview at T1 as well (see Table 2).

3.2.4. Control Variables

We controlled for gender, special-needs education, and nationality in all of the multilevel analyses. For nationality, a dummy variable was created that was coded 0 if at least one parent was Swiss and 1 if both parents were non-Swiss. The latter included more than eighty nationalities.

3.3. Procedure

The parents were asked to sign an informed consent form at the beginning of the first interview; informed consent was renewed at wave 4. The computer-assisted face-to-face interviews with parents lasted an average of one hour. In the first three waves, computer-assisted personal child assessments lasting 45 minutes were conducted at the school. In the fourth wave, 90-minute classroom-based paper-and-pencil surveys were utilized. The interviews were conducted by forty-four interviewers who had been thoroughly trained by the research team. The child's teacher completed a questionnaire on each child's social behavior.

3.4. Analysis Approach

Hierarchical linear modeling (HLM Version 6.08) was used to assess the intervention effects on child outcomes. The original design of the study combined PATHS and a family-based intervention (Triple-P) (for details, see Malti et al. 2011). We recoded treatment assignment as two

dummy variables to compare the PATHS and Triple-P conditions separately with the control condition. Thus, a standard approach to coding a 2 x 2 design (two levels of factor A crossed with two levels of factor B) was used to analyze program effects. This 2 x 2 design allowed us to specify the different timings of the interventions as well as the inclusion of the interaction involving the PATHS plus Triple-P condition. The cross-product of the PATHS plus Triple-P interaction answers the question of whether adding PATHS improves the effects of Triple-P and whether adding Triple-P improves the effects of PATHS. The models incorporated three levels: data-collection wave (level 1), child (level 2), and school (level 3). These levels were employed in conjunction with a two-way interaction between time and intervention to measure the treatment effects. Moderator effects were tested by three-way interactions between intervention, the respective moderating variable, and time point.

3.5. Results

3.5.1. Initial Equivalence and Attrition

Table 1 presents descriptive statistics for all the outcome variables, and Table 2 presents descriptive statistics for all the moderator variables. Here we present data for the PATHS only ($n = 360$) versus the control condition ($n = 356$) because of our analytic interest in the PATHS program.

Table 1: Outcome variables by treatment condition and time period

	Treatment condition							
	Control group				PATHS-only group			
Outcome variable	*M (SD)*				*M (SD)*			
Teacher reports	Pre 1	Pre 2[a]	Post	Follow-up	Pre 1	Pre 2[a]	Post	Follow-up
Aggressive behavior	0.51 (0.68)	0.41 (0.55)	0.45 (0.60)	0.53 (0.68)	0.56 (0.63)	0.56 (0.61)	0.62 (0.69)	0.48 (0.68)
ADHD	1.11 (0.97)	0.85 (0.94)	0.87 (0.94)	1.14 (1.04)	1.27 (1.02)	1.15 (1.00)	1.13 (1.01)	1.00 (0.89)
Prosocial behavior	2.16 (0.82)	2.14 (0.88)	2.42 (0.92)	2.26 (0.79)	2.34 (0.79)	2.43 (0.76)	2.54 (0.77)	2.24 (0.80)

[a] Pre 2 is a second baseline score accounting for the time-lagged implementation of the PATHS and family interventions.

Table 2: Moderator variables by PATHS-only treatment condition versus control condition at T1

	Treatment condition	
	Control	PATHS-only
Moderator	*M (SD)/ %*	*M (SD)/ %*
Child characteristics[a]		
Moral emotions	3.47 (0.59)	3.32 (0.68)
Aggressive problem-solving	0.15 (0.22)	0.16 (0.21)
Competent problem-solving	0.69 (0.30)	0.71 (0.27)
Economic characteristic		
Socioeconomic status (ISEI	47.12 (18.10)	45.46 (17.08)
Financial difficulties: Yes	16	17
Single-parent household: Yes	13	15
Control variable		
Gender: Female	45	50
Nationality: Non-Swiss	39	28
Special education: Yes	8	6

Notes:
ISEI = International Socio-Economic Index.
[a] For descriptive statistics of initial child behavior as moderator, see Time 1 variables in Table 1.

ANOVAs were conducted to determine the equivalence of the treatment and control groups across outcomes. The models took account of the nesting of students within schools, treating schools as a random effect. Although at baseline some of the outcome measures were higher in the PATHS group than in the control group, our preliminary analyses revealed that none of the baseline differences are significant. Table 3 displays the correlations between the study variables across the four treatment conditions. Attrition was low across the waves of data collection and was comparable in the four treatment conditions. Specifically, children in the control condition completed an average of 3.68 waves, children in the PATHS condition an average of 3.76 waves, children in the Triple-P condition an average of 3.64 waves, and children in the PATHS plus Triple-P condition an average of 3.72 waves.

Table 3: Intercorrelations between study variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Aggressive behavior[a]	–											
2. ADHD	.66***	–										
3. Prosocial behavior	-.39***	-.36***	–									
4. Moral emotions	.03	.05	-.02	–								
5. Aggressive problem-solving	.07*	.10***	-.08**	.02	–							
6. Competent problem-solving	-.07*	-.10***	.12***	-.02	-.67***	–						
7. Socioeconomic status	-.16***	-.19***	-.03	-.11***	.04	-.02	–					
8. Financial difficulties	.13***	.12***	-.01	.04	-.03	.02	-.13***	–				
9. Single-parent household	.06	.07*	.02	.02	.01	.01	-.02	.15***	–			
10. Gender	-.24***	-.27***	.38***	-.03	-.13***	.14***	-.02	.01	.05	–		
11. Nationality	.11***	.08**	-.07*	.05	-.02	-.01	-.40***	.01	-.12***	.02	–	
12. Special education	.12***	.14***	-.07*	.02	.11***	-.13***	-.22***	.10***	-.04	-.10***	.17***	–

Notes:
ADHD = Attention deficit/impulsivity
[a] Because all behavior scales were related across time points, aggregate scores across time are reported.
*p < .05. **p < .01. ***p < .001.

3.5.2. Treatment Effects at Follow-up (T4)

We report treatment effects only at follow-up because we have shown elsewhere that there were no treatment effects at post-test (Malti et al. 2011). Preliminary, unconditional models were run to ascertain the proportion of variance of each dependent variable that could be attributed to school level. Intraclass correlations were estimated in the control group using unconditional three-level hierarchical linear modeling. The intraclass correlation for school level was .25 across all teacher-reported outcome variables.

The multilevel models were then run to obtain intent-to-treat estimates of the intervention effects on aggressive behavior, ADHD, and prosocial behavior as measured by the Social Behavior Questionnaire. We used continuous moderator variables in all multilevel analyses and computed interaction effects between the treatment variable and the respective continuous moderator variable. For clarity's sake, we again describe only the findings for the PATHS only condition versus the control condition, because of our focus on PATHS effects. However, the full factorial design was used to analyze the data.

Table 4 presents the multilevel findings for the outcomes at follow-up. For each outcome variable, Model 1 included all the level 2 covariates, and Model 2 included

the respective interaction terms between treatment, the moderator variable, and time point. For the sake of brevity and clarity, treatment interaction terms involving the moderators are reported only if at least one of them is significant across outcomes.

Table 4: Parameter estimates of treatment effects on selected teacher-rated outcomes at follow-up

Parameter	Outcome		
	Aggressive behavior	ADHD	Prosocial behavior
Time x treatment	-.08 (.04)*	-.11 (.06)**	-.08 (.08)
		Child characteristic	
Aggressive problem-solving	–0.05 (0.08)	0.25 (0.15)*	0.03 (0.09)
Aggressive problem-solving x time x treatment	0.10 (0.06)	–0.04 (0.07)	–0.06 (0.07)
Aggressive problem-solving x time x treatment	0.10 (0.06)	–0.04 (0.07)	–0.06 (0.07)
Competent problem-solving	–0.08 (0.06)	–0.19 (0.10)*	0.14 (0.07)*
Competent problem-solving x time x treatment	–0.03 (0.03)	–0.08 (0.03)*	–0.04 (0.03)
Moral emotions	0.01 (0.02)	0.05 (0.04)	–0.01 (0.02)
Moral emotions x time x treatment	–0.03 (0.01)*	–0.02 (0.01)*	–0.05 (0.04)
Baseline behavior	1.09 (0.03)***	1.06 (0.02)***	1.10 (0.03)***
Baseline behavior x time x treatment	0.02 (0.03)	–0.03 (0.02)	–0.01 (0.01)
		Economic characteristics[a]	
Socioeconomic status	–0.01 (0.01)**	–0.01 (0.01)**	–0.01 (0.02)*
Financial problems	0.13 (0.05)*	0.22 (0.07)**	–0.01 (0.05)
Single-parent household	0.11 (0.04)*	0.17 (0.08)*	–0.05 (0.05)
		Control variable	
Girl	–0.18 (0.03)***	–0.38 (0.05)***	0.49 (0.04)***
Non-Swiss nationality	0.13 (0.03)***	0.03 (0.06)	–0.09 (0.04)*
Special-class education	0.02 (0.08)	0.16 (0.11)	–0.12 (0.06)*

Notes:
ADHD = Attention deficits/impulsivity
[a] No moderation by economic factors was found.
*p < .05. **p < .01. ***p < .001.

Aggression. Children in the PATHS group were reported by their teachers as having a greater decrease in aggressive problem behaviors than children in the control group (effect size = 0.42; see Table 4). The treatment effect on teacher-rated aggression was moderated by level of moral emotions at baseline (effect size = 0.12). Children who exhibited higher levels of moral emotions and received the intervention showed larger reductions in aggression at follow-up (by teacher report) than did children who started school with low levels of moral emotions. In addition, baseline aggression, financial problems, single-parent household, and non-Swiss nationality predicted higher aggression at the follow-up. Furthermore, SES and female gender predicted lower aggression at the follow-up.

ADHD. Children in the PATHS group were reported by their teachers as having a significantly greater decrease in ADHD related problems than children in the control group (effect size = 0.46; see Table 4). However, the treatment effect on teacher-rated ADHD was moderated by the level of moral emotions at baseline (effect size = 0.10). The main effect was also moderated by initial level of competent problem-solving strategies (effect size = 0.40). Children who exhibited higher levels of moral emotions and competent problem-solving strategies, and received the intervention, showed larger reductions in ADHD at follow-up (by teacher report) than did children who started school with low levels of moral emotions and competent problem-solving strategies. Furthermore, aggressive problem-solving strategies, baseline ADHD, financial problems and single-parent household predicted higher ADHD at follow-up. In contrast, competent problem-solving strategies, SES and female gender predicted lower ADHD at follow-up.

Prosocial behavior. The results suggest that overall, children in the PATHS condition did not differ from children in the control condition on prosocial behavior (Table 4). In addition, no significant interaction terms representing potential moderation by child characteristics or economic factors was found. Competent problem-solving strategies, baseline prosocial behavior and female gender predicted higher prosocial behavior at follow-up, whereas non-Swiss nationality and special needs education predicted lower prosocial behavior at follow-up.

4. Discussion

A large-scale randomized controlled trial of a cohort of children attending public elementary schools in Zurich, Switzerland investigated the effectiveness of the PATHS curriculum on teacher reports of children's aggressive problem behavior, ADHD, and prosocial behavior at follow-up (two years later), as well as the moderating roles of baseline child characteristics and economic factors (as measured before the intervention) on the effects of the interventions at follow-up.

As reported elsewhere, the analyses revealed a main effect of PATHS on ADHD and aggression as reported by teachers at follow-up (see Malti et al. 2011). The findings support previous research in the United States demonstrating the positive effects of social competence programs such as PATHS on ADHD/impulsivity problems (Riggs et al. 2006). However, as reported elsewhere, there were no significant treatment effects for most teacher-rated outcomes and almost all parent- and child-rated outcomes (Malti et al. 2011).

Overall, we found only very limited evidence that the intervention effects were moderated by baseline child characteristics. There was evidence that children in the PATHS condition who at baseline anticipated more negative emotions following transgressions were rated by their teachers as showing slightly larger reductions in ADHD at follow-up than children who started with low levels of moral emotions. Other research indicates that these moral emotions reduce externalizing symptoms (Arsenio et al. 2006; Malti and Krettenauer 2012).

Additionally, children in the PATHS condition who displayed high levels of competent problem-solving strategies before the intervention were rated by their teachers as showing slightly larger reductions in ADHD at follow-up than children who started with low levels of competent problem-solving skills. This finding is consistent with longitudinal research showing that socially competent problem-solving skills distinguish the trajectories of aggressive behavior (Lansford et al. 2006), as children who have strong social-cognitive skills before the intervention benefit most from the intervention in terms of a decrease in maladaptive behavior. Contrary to the results of previous randomized controlled trials of PATHS in the United States (Bierman et al. 2010), we did not find a moderating effect of baseline behavior on treatment outcomes. Further research is needed to disentangle these inconsistencies and investigate questions surrounding treatment dose for children at risk of behavioral problems.

Our findings confirm several of the expected direct effects of economic variables such as family socioeconomic status, financial problems, and single-parent household on the outcome variables. Overall, our findings support research on the role of economic risk in exacerbating negative behavioral outcomes (Keenan et al. 1997). The effects of PATHS were not moderated by these factors, contradicting

the results of other studies (Raver et al. 2009). This difference may be related to the fact that socioeconomic disparities in Switzerland are smaller than in the United States, where most comparable randomized controlled trials have been conducted.

This study was not without limitations. First, we only examined one informant (i.e., teacher report) because treatment effects of a school-based intervention are most likely to be observed in the school context and in teacher-assessed outcomes; we have documented elsewhere that there were only a few positive effects on teacher-rated child outcomes at follow-up, but not at post-test, (Malti et al. 2011). We also do no know whether any similar moderation effects hold for other informants (Malti et al. 2011). Second, the positive treatment effects were only found in the PATHS only group, but the PATHS plus Triple-P treatment did not have any stronger effects on teacher-rated externalizing behavior than PATHS alone. It remains to be disentangled why no additional effects were found in the combined group. Third, as in many studies, the moderators were examined post-hoc rather than based on prior theoretical considerations. Post-hoc analyses are always at a risk of finding effects by pure chance and should hence be treated with caution. Fourth, at present we do not know whether any of the effects are maintained over a longer period of time. We did not find any positive treatment effects at post-test and most of the outcomes at follow-up were not significant either (Malti et al. 2011).

Despite these limitations, the present study contributes useful knowledge about the influence of moderators on the effects of a school-based intervention on children's externalizing behavior.

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