Extended Education and Externalizing Behavior: Utilization Intensity, Interaction Quality and Peers as Possible Moderators

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Abstract: So far, empirical evidence regarding the effects of extended education on externalizing behavior is mixed. To explore possible moderators, multilevel-analyses were conducted in a longitudinal sample of 492 students from 51 all-day schools in Switzerland. No main effects of utilization intensity, interaction quality and externalizing behavior in peers on the development of externalizing behavior from grade 1 to grade 2 were found. However, the relationship between utilization intensity and change in externalizing behavior was moderated by externalizing behavior in peers and by caregiver-student interactions. Subsequent analyses display a complex pattern of these cross-level interactions, indicating confounding characteristics. Implications for future research are discussed.

Keywords: extended education, all-day schools, externalizing behavior, quality, peer contagion

Introduction

Expectations regarding the benefit of extended education are manifold, including the promotion of prosocial and desirable behavior while counteracting externalizing behavior such as physical or verbal aggression, disruptive manners, delinquency and the like. And why should this not be the case? Extended education settings offer structure, supervision, activities and interactions with both peers and adults, which might otherwise be missing. However, empirical evidence so far is inconclusive, and some studies have even found adverse effects of extended education, amplifying the need to find out more about the conditions under which extended education succeeds in reducing externalizing behavior (Durlak, Weissberg, & Pachan, 2010; Fischer, Kuhn, & Züchner, 2011; Kremer, Maynard, Polanin, Vaughn, & Sarteschi, 2015; O'Hare, Biggart, Kerr, & Connolly, 2015; Schüpbach, Ignaczewska, & Herzog, 2014; Wade, 2015). In this article, several possible moderators are addressed in a longitudinal sample of primary all-day schools in Switzerland: Does the degree of externalizing behavior in peers, the quality of interactions between caregivers and students, or the intensity of extended education utilization influence outcomes?

Most primary schools in Switzerland provide school hours during five mornings a week and additional school hours in one to four afternoons (EDK, 2013). Beyond those regular school hours, supervision usually has to be organized by the parents. However, especially in the past decade, societal changes and political efforts have led to an increase in all-day schools across Switzerland (Stern et al., 2013), which are defined as schools not only comprising regular school hours but also offering education and care during the rest of the day (EDK, 2013). Those services (referred to as extended education) generally include lunch, a supervised program in the afternoon (e.g. activities, free-play, or homework), and, although less frequently, before-school care. While utilization of extended education is obligatory in some instances (obligatory all-day schools), most all-day schools implement an open-attendance model, referring to a modular system of extended education, which allows parents to decide whether their children use the respective services or not (voluntary all-day schools).

Since all-day schools offer additional opportunities to develop positive relationships in a structured and supervised environment, they are met with high societal and academic expectations regarding children's socio-emotional development (Aeberli & Binder, 2005), including the reduction or prevention of externalizing behavior. Externalizing behavior refers "to a grouping of behavior problems that are manifested in children's outward behavior and reflect the child negatively acting on the external environment" (Liu, 2004, p. 93), such as disruptive, hyperactive and aggressive behavior. Externalizing behavior during the first school years has been found to reduce the probability of receiving a high school degree (McLeod & Kaiser, 2004), was linked to low academic performance in higher grades (Metsäpelto et al., 2015), and predicted substance use, abuse and dependence in late adolescence and young adulthood (Fergusson, Horwood, & Ridder, 2007). Additionally, even milder levels of externalizing behavior during school years seem to increase the likelihood of developing clinical disorders (Goodman, Lamping, & Ploubidis, 2010).

Review of the Literature

Effects of Extended Education on Externalizing Behavior

So far, little is known about the actual effects of extended education in all-day schools on externalizing behavior, especially regarding such schools in Switzerland: In a sample of 295 first- to third-graders, Schüpbach et al. (2014) did not find a significant effect of participation in extended education on the development of parent-rated socio-emotional behavioral strengths (including items measuring hyperactivity). Additional research regarding all-day schools stems from Germany, where a comparable education and care system has been implemented. Fischer et al. (2011) examined 6'853 fifth-grade students, using 3 measurement points during 2005 to 2009. Participation in extended education was associated with a decrease in self-rated problematic behavior at school, as well as in self-rated violence and absenteeism. Kanevski and von Salisch (2011) explored physically aggressive behavior in a sample of 380 seventh-grade students. Male students from all-day schools showed a de-

crease in peer-rated physically aggressive behavior during seventh-grade, compared to male students from half-day schools. However, for female students, the opposite results were found, favoring half-day schools.

Although not identical to all-day schools, after-school programs, which have been implemented in several other countries, share some properties in that they provide a structured and supervised setting for children after regular school hours, and offer a variety of social activities and academic enrichment. Yet, as the name implies, after-school programs are comprehensive programs, often targeting specific developmental aspects, and they are not part of the school itself (Kremer et al., 2015). Beside these differences and keeping in mind that all-day schools may also strongly vary in goals and activities, the extensive research on after-school programs provides some insight regarding the possible effects of extended education on externalizing behavior. However, results from meta-analyses are mixed (Durlak et al., 2010; Kremer et al., 2015). In fact, several studies even reported adverse effects of after-school programs on externalizing behavior (O'Hare et al., 2015; Wade, 2015), highlighting the need to consider and explore possible moderating aspects.

Since both after-school programs and all-day schools can be considered as prevention programs, the broader field of prevention research may offer valuable clues regarding such moderators. Extensive reviews of prevention efforts identified several features, distinguishing successful interventions from rather ineffective ones (Browne, Gafni, Roberts, Byrne, & Majumdar, 2004; Nation et al., 2003), including sufficient dosage, opportunities to develop positive relationships, and well-trained personnel. An additional review points to potential negative influences of peers ("peer-contagion", Dishion & Tipsord, 2011), especially when elevated levels of problematic behavior are prevalent.

Utilization Intensity

Among possible moderators, utilization intensity has probably received the biggest attention in past studies. In their review on participation in after-school programs, Roth, Malone, and Brooks-Gunn (2010) defined intensity as "frequency of attendance during one program year" (p. 314). Although some of the reviewed studies reported that intensity had a positive effect on various developmental outcomes, including problem behavior and peer relations, this was mainly the case when students with high participation were compared to students with no participation. Most studies exploring higher versus lower participation did not find that intensity was a significant influencing factor. The authors conclude that, "general statements proclaiming that greater participation in formal afterschool programs leads to improved outcomes are premature and inaccurate" (p. 321). As with general utilization, intensity alone does not seem to warrant positive effects which raises the question of possible moderators. Regarding the cited studies on all-day schools, only Schüpbach et al. (2014) explored a possible influence of intensity on externalizing behavior: Among 34 students utilizing extended education, utilization intensity was not linked to the development of socio-emotional behavioral strengths.

Caregiver-Student Interactions

One of the main assumptions underlying expectations of positive socio-emotional outcomes through all-day schools and after-school programs is the provision of a structured environment where children experience positive interactions with peers and caregivers (Fischer et al., 2011; Wade, 2015). In line with those expectations, positive caregiver-student relations in after-school programs have been linked to a more favorable socio-emotional development, also with regard to externalizing behavior (e.g. Pierce, Bolt, & Vandell, 2010; Wade, 2015). Even more importantly, in one study, participants who experienced negative relationships with their caregivers showed an increase in externalizing behavior compared to non-participants (Wade, 2015). With regard to all-day schools, Fischer et al. (2011) included caregiver-student relationship (rated by students) as predictor of problematic behavior at school, finding a negative association for all three time points. Unfortunately, they did not include caregiver-student relationships to predict change in problematic behavior nor as a possible moderator of the effect of all-day schools. Further, none of the other reviewed papers investigating all-day schools considered caregiver-student interactions in their analyses.

Externalizing Behavior in Peers

In their review regarding peer contagion, Dishion and Tipsord (2011) point out that peers can exert both positive and adverse influences during childhood and adolescence. The latter can be caused through deviancy training, which refers to interactions promoting deviant talk or behavior. For example, one reviewed paper studied coercive behavior in children and found that coercion by peers at age 5 had a significant effect on conduct problems at age 8 (Snyder et al., 2008). Such processes can be particularly problematic in settings, where children with elevated levels of externalizing behavior are aggregated, as is often the case in intervention studies but may also happen in general education settings, sometimes with adverse outcomes (Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Warren, Schoppelrey, Moberg, & McDonald, 2005). Since many after-school programs specifically target students at risk, it may seem surprising that this aspect has received little to no attention so far. There are no publications we know of to date, that have explored the possible (moderating) effect of externalizing behavior in peers with regard to after-school programs or all-day schools.

Hypotheses

According to our review of the literature, previous studies produced mixed results regarding the effects of extended education on externalizing behavior. Therefore, it seems important to understand under which circumstances extended education can reduce externalizing behavior. While a possible moderating effect of utilization

intensity has been studied in several articles, the quality of caregiver-student interactions and especially possible adverse effects of externalizing behavior in peers have received little to no attention. Taking a longitudinal approach towards change in externalizing behavior in a sample of first to second graders enrolled in extended education, this contribution aims to explore the following research questions: (1) Does the intensity of extended education utilization influence change in externalizing behavior? (2) Does the level of externalizing behavior in peers influence change in externalizing behavior? (3) Does the quality of caregiver-student interactions influence change in externalizing behavior? (4) With regard to change in externalizing behavior, does the intensity of extended education utilization interact with externalizing behavior in peers or with the quality of caregiver-student interactions? Consequently, the hypotheses with regard to main effects of possible moderators (H1 – H3) and their interactions (H4a – H4b) are formulated as following:

H1: Higher intensity of extended education utilization predicts change in externalizing behavior (i.e. increase or decrease) compared to lower intensity.

H2: Higher levels of externalizing behavior in peers predict an increase in externalizing behavior compared to lower levels.

H3: Higher quality of caregiver-student interactions predicts a decrease in externalizing behavior compared to lower quality.

H4a: With increasing levels of externalizing behavior in peers, the effect of utilization intensity on externalizing behavior becomes more positive (i.e. less favorable: greater increase or smaller decrease in externalizing behavior as an effect of higher utilization intensity).

H4b: With an increasing quality of caregiver-student interactions, the effect of utilization intensity on externalizing behavior becomes less positive (i.e. more favorable: smaller increase or greater decrease in externalizing behavior as an effect of higher utilization intensity).

Method

Sample

Data for this article are drawn from the longitudinal research project *EduCare-TaSe – All-Day School and School Success?*, which is funded by the Swiss National Science Foundation. EduCare-TaSe is studying children in grades 1 and 2 at voluntary all-day schools, with some children utilizing extended education, whereas others do not. For economic reasons, only primary schools with at least two parallel classes at the primary school level were considered. Based on the definition proposed by the Swiss Conference of Cantonal Ministers of Education (EDK, 2013), all-day schools were defined as schools with (1) open-attendance, voluntary extended education, (2) extended education on at least 3 days per week, and (3) extended education at lunch-

time and in the afternoon. Using estimates provided by the education departments of the cantons in German-speaking Switzerland, 251 primary all-day schools were identified, of which 53 schools with a total of 1'990 students agreed to participate, representing 13 cantons from the German-speaking part of Switzerland. By the end of grade 2, the sample decreased by 127 students, with additional students missing ratings regarding their participation in extended education (58 students), their externalizing behavior (234 students) or their sex (10 students). Only students enrolled in extended education for at least one year are considered for this article, resulting in a subsample of 492 students from 102 classes and 51 all-day schools which is used in subsequent analyses.

Data-Collection

Data-collection took place in between 2014 and 2015. At the end of grade 1 and again at the end of grade 2, class-teachers rated each of their students' externalizing behavior via online-survey. For each grade, intensity of extended education utilization was inquired through the head of extended education. Additionally, at the end of grade 1, quality of caregiver-student-interactions was rated via observational measure.

Change in Externalizing Behavior

The German version of the Strengths and Difficulties Questionnaire for teachers (SDQ; Goodman, 1997) was used to measure students' externalizing behavior. The SDQ for children and adolescents aged 4–17 consists of five subscales, including behavioral problems and hyperactivity, which can be rated by teachers, parents, or in the case of adolescents, by students themselves. Factorial structure, internal consistency, test-retest reliability, inter-rater agreement between parents and teachers, concurrent validity and predictive validity regarding subsequent clinical diagnoses has been explored in several international samples with generally good results, especially for the teacher version (Stone, Otten, Engels, Vermulst, & Janssens, 2010). Regarding the German translation, factorial structure and internal consistency has been confirmed in a representative sample (Woerner, Becker, & Rothenberger, 2004). However, because of the low discriminative validity between behavioral problems and hyperactivity in general population samples, Goodman et al. (2010) proposed a second-order factor to combine those two subscales into externalizing behavior. The resulting scale consists of ten items such as "Often fights with other children or bullies them", "Often has temper tantrums or hot tempers" or "Generally obedient, usually does what adults request" (the complete SDQ-survey including its German translation can be accessed on www.sdqinfo.org). Teachers are asked to rate each item with respect to a child's behavior over the last six months as "Not True" (0), "Somewhat True" (1) or "Certainly True" (2) and ratings are added up to a subscale representing externalizing behavior, with possible values from 0 to 20. Internal consistency is good ($\alpha = 0.86$ for grade 1, 0.87 for grade 2) and comparable to those found by Goodman et al. (2010; $\alpha = 0.88$). Since the SDQ is a screening instrument

with a non-normal distribution and a strong floor effect, the difference in externalizing behavior between the two time-points was calculated by subtracting the level of externalizing behavior at the end of grade 1 from the level of externalizing behavior at the end of grade 2. The resulting dependent variable, representing change in externalizing behavior (scaled from -20 to 20), has an approximately normal distribution with positive scores indicating an increase and negative scores a decrease of externalizing behavior between t1 and t2, respectively (M=-0.48, SD=2.60). To control for initial levels, externalizing behavior at the end of grade 1 was included as control variable (M=4.71, SD=4.16).

Student's Sex

As a second control variable, student's sex was inquired through class lists and a short survey with students during grade 2, and coded as male (0) or female (1), with 51% of the students being female.

Utilization Intensity

At the beginning of each grade, parents usually have to register their children for certain days and modules of extended education during that school year (e.g. each Wednesday from 11:45 am to 4:30 pm). For each child, intensity of extended education utilization (in minutes) during both grade 1 and grade 2 was inquired through the head of extended education. With regard to this paper, the average amount of hours spent taking part in extended education during both grades was calculated. On average students utilized extended education for 8.14 hours per week (SD=7.24).

Externalizing Behavior in Peers

Since classmates constitute a student's primary peer group in school, we also expect them to spend more time together during extended education. Therefore, teachers' ratings of externalizing behavior in students utilizing extended education during grade 1 were aggregated at the class level, indicating higher or lower initial levels of externalizing behavior in peers, with possible values from 0 to 20 (M=4.65 SD=2.69).

Quality of Caregiver-Student Interactions

At the end of grade 1, trained members of the research team took observations within extended education. Observations took place for at least four hours with the "Hort- und Ganztagsangebote-Skala" (HUGS; Tietze, Rossbach, Stendel, & Wellner, 2007), an adaption of the School-Age Care Environment Rating Scale (Harms, Jacobs, & White, 1996) being used as rating instrument. HUGS consists of fifty features, of which nine features constitute a subscale measuring interactions. Since three of those features specifically tap into caregiver-parents interactions or aspects of collabora-

tion, we only consider six features (i.e. communication between caregiver and children, interactions between caregiver and children, code of conduct / discipline, child supervision, welcome- and goodbye-procedures, handling of interactions between children) as representing caregiver-student interactions in this contribution. For each feature, ratings between 0 (inadequate quality) and 6 (excellent quality) were possible. Internal consistency for caregiver-student interactions is acceptable (α=0.72).

Results

Analytic Strategy

Multilevel regression analyses were performed using Mplus 7.3 (Muthén & Muthén, 1998-2012). Descriptive statistics for all variables in our models are presented in table 1. To test our hypotheses, several three-level analyses were performed to predict change in externalizing behavior, with students (level 1) nested into classes (level 2) nested into schools (level 3). First, we calculated a one-way ANOVA model (null-model) to determine the variation in the development of externalizing behavior for different levels. Second, we calculated several random-intercept models by adding predictors at the student level (model 1), the class level (model 2) and the school level (model 3).

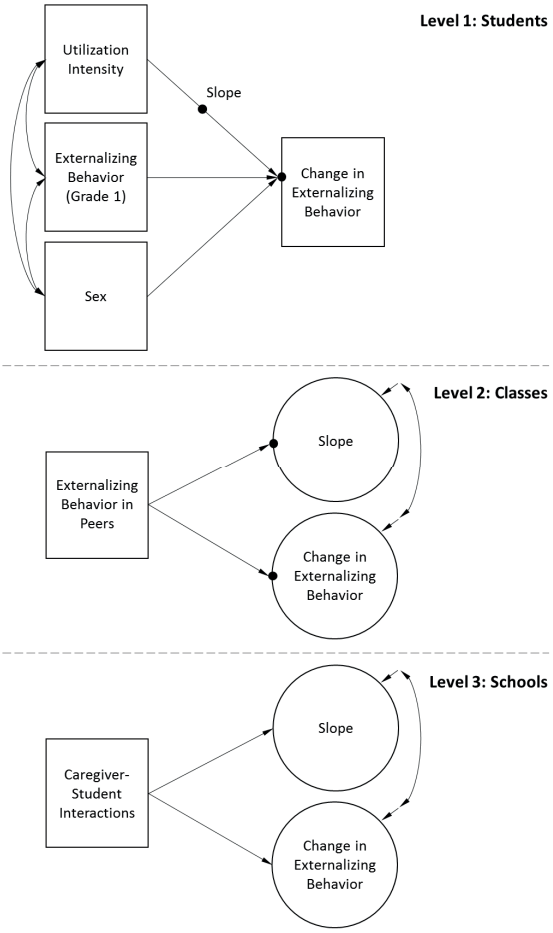
Table 1. Descriptive Statistics.

	N	Min	Max	M	SD
Students					
Change in Externalizing Behavior	492	-9.00	8.00	-0.48	2.60
Utilization Intensity	492	0.50	36.67	8.14	7.24
Externalizing Behavior (Grade 1)	492	0.00	18.00	4.71	4.16
Sex	492	0.00	1.00	0.51	0.50
Classes					
Externalizing Behavior in Peers	102	0.00	13.50	4.65	2.69
Schools					
Caregiver-Student Interactions	51	1.20	6.00	4.48	0.95

Measurement Scales: Change in Externalizing Behavior (-20 to 20), Utilization Intensity (ratio scale), Externalizing Behavior (0 to 20), Sex (0=male, 1=female), Externalizing Behavior in Peers (0 to 20), Caregiver-Student Interactions (0 to 6)

Finally, we calculated an intercept-and-slopes-as-outcomes model (model 4; figure 1) to explore possible cross-level interactions. As an estimator, we used ML estimation with robust standard errors (MLR) and predictors were centered at the grand-mean. Additionally, externalizing behavior in peers and caregiver-student interactions were z-standardized. Unstandardized coefficients are reported and we calculated R^2 for each level by comparing the initial variance estimates to those in the respective models as proposed by Heck and Thomas (2015). Since the total amount of variance on each level also varies across models, R^2-estimates have to be considered with caution. Therefore, we further provide log-likelihood and AIC to allow for a better comparison of different models, with lower values indicating better model-fit (Byrne, 2012). A robust chi-square difference test based on log-likelihood and scaling correction factors was used to compare models (http://www.statmodel.com/chidiff.shtml), as proposed by Muthén and Muthén (1998–2012).

Figure 1. Intercept-and-Slopes-as-Outcomes (Model 4).



Variance Partitioned at the Student, Class, and School Level

On average, externalizing behavior decreased by 0.46 scale points from grade 1 to grade 2. Most of the variance in this change in externalizing behavior is due to student characteristics (86.3%), with class characteristics (8.5%) and school characteristics (5.2%) having a smaller impact. Results for subsequent analyses are reported in table 2.

Hypothesis 1: Intensity of Extended Education Utilization

To examine a possible main effect of extended education utilization intensity on change in externalizing behavior, we added utilization intensity as a predictor on the student level, while controlling for initial levels of externalizing behavior and student's sex (Model 1). As results show, the development in externalizing behavior is more favorable for students with higher initial levels of externalizing behavior ($p \leq .001$): A one-point increase in externalizing behavior in grade 1 is associated with a 0.20 decrease in externalizing behavior by the end of grade 2. For student's sex, a trend emerged, with female students having a 0.47 decrease in externalizing behavior ($p \leq .10$) compared to male students. In contrast, intensity of extended education utilization failed to exert a significant impact. Compared to the null-model, those three predictors explained about 9% of the variance at the student level, 11% at the class level and 19% at the school level. Model-fit also improved significantly ($\chi^2=37.92$, df=3, $p \leq .001$), with both smaller log-likelihood and BIC.

Hypotheses 2 and 3: Peer Group and Caregiver-Student Interactions

Next, we tested a possible main effect of initial externalizing behavior in peers on the development of externalizing behavior by adding this variable at the class level (Model 2), although with no significant result. Similarly, we tested a possible impact of caregiver-student-interactions (Model 3) at the school level. Again, no significant main effect was found. Both model 2 and 3 did not substantially improve R^2 or fit indices, compared to model 1.

Hypotheses 4a and 4b: Cross-Level Interactions

In order to test possible interactions between predictors, the slope between utilization intensity and change in externalizing behavior was allowed to vary between classes and schools and was tested for cross-level interactions. As can be seen in Model 4, the impact of extended education utilization intensity on externalizing behavior was moderated by both initial externalizing behavior in peers and caregiver-student interactions: For a one standard-deviation increase in peers' externalizing behavior, an additional hour of extended education utilization predicted a 0.05 increase in externalizing behavior by the end of grade 2 ($p \leq .05$).

Table 2. Multilevel-models predicting change in students' externalizing behavior.

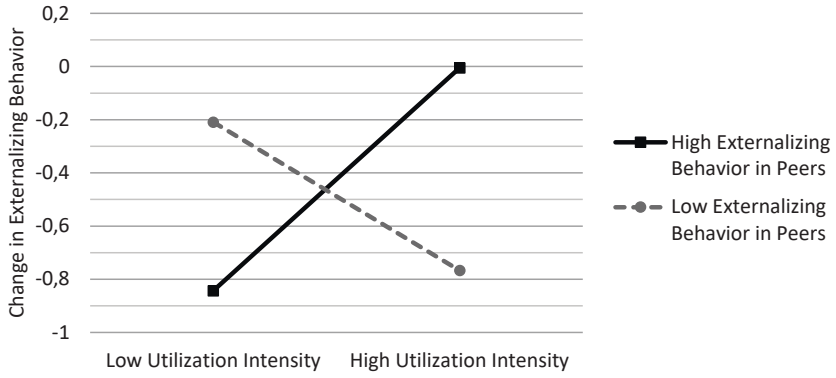
Parameter		**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept		-0.44** (0.16)	-0.44** (0.15)	-0.44** (0.15)	-0.46** (0.15)
Level 1: Students					
Utilization Intensity		0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Externalizing Behavior (Grade 1)		-0.20*** (0.03)	-0.21*** (0.03)	-0.21*** (0.03)	-0.20*** (0.03)
Female		-0.47^{+} (0.25)	-0.47^{+} (0.25)	-0.48^{+} (0.25)	-0.48* (0.24)
R^2		*0.09*	*0.10*	*0.09*	*0.14*
Level 2: Classes					
Externalizing Behavior in Peers			0.04 (0.13)	0.04 (0.13)	0.00 (0.30)
Externalizing Behavior in Peers * Utilization Intensity					0.05* (0.02)
R^2		*0.11*	*0.11*	*0.11*	*0.09*
Level 3: Schools					
Caregiver-Student Interactions				0.03 (0.15)	0.04 (0.15)
Caregiver-Student Interactions * Utilization Intensity					-0.04** (0.02)
R^2		*0.19*	*0.18*	*0.18*	*0.42*
Fit Indices	**Model 0**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Log-Likelihood	-1158.82	-1133.63	-1133.59	-1133.57	-1124.03
AIC	2325.65	2281.25	2283.18	2285.15	2278.05

*N = 492(students) 102(classes) 51(schools); unstandardized B coefficients (SE); $^{+}$p≤.10, *p≤.05, **p≤.01, ***p≤.001.*

Additionally, for a one standard-deviation increase in caregiver-student interaction quality, an additional hour of extended education utilization predicted a 0.04 decrease in externalizing behavior by the end of grade 2 ($p \leq .01$). In short: Lower levels of externalizing behavior in peers and higher quality of caregiver-student interactions were both linked to a more favorable relationship between utilization intensity and change in externalizing behavior. Compared to model 1, after adding both cross-level interactions, another 5% of the variance at the student level and another 23% at the school level was explained. Model-fit also improved, with both lower log-likelihood and AIC ($\chi^2=20.32$, df=8, $p \leq .01$).

To allow for an easier interpretation of those cross-level interactions, the same model was calculated with z-standardized utilization intensity. Regression-coefficients were then used to estimate change in externalizing behavior for students with high levels (1 standard deviation above mean) or low levels (1 standard deviation below mean) of different characteristics (Richter, 2007). As figure 2 shows, for students with high levels of externalizing behavior in peers, higher utilization intensity seems to increase externalizing behavior. In contrast, for students with low levels of externalizing behavior in peers, higher utilization intensity seems to reduce externalizing behavior. Also in line with our hypothesis, students who experience high levels of externalizing behavior among peers seem to develop less favorably than students who experience low levels of externalizing behavior among peers, if they use extended education more intensively. However, for students with low utilization intensity, the contrary seems to be the case, even suggesting an adverse effect of lower externalizing behavior in peers.

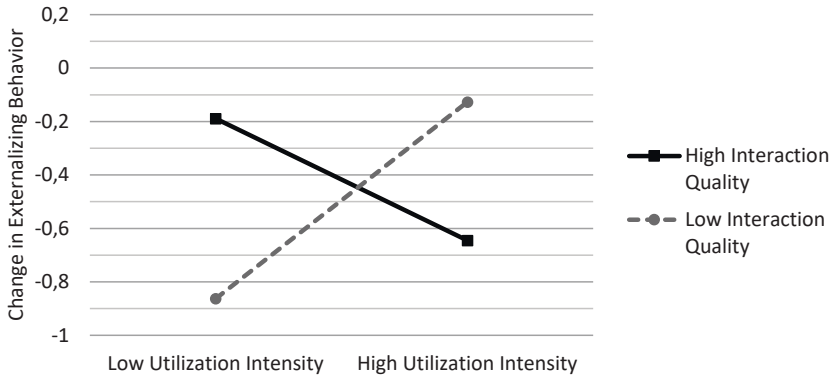
Figure 2. Differences in students' development of externalizing behavior, based on externalizing behavior in peers (±1 SD) and utilization intensity (±1 SD), controlling for individual and school level variables.



Similar results have been found with regard to caregiver-student interactions: As figure 3 indicates, higher utilization intensity decreases externalizing behavior compared to lower utilization intensity, if caregiver-student interactions have a higher quality. For schools with lower interaction quality, the contrary seems to be the case. Furthermore, students who experience high quality caregiver-student interactions seem to develop more favorably than students from schools with low quality inter-

actions, if they use extended education more intensively. However, for students with low utilization intensity, high quality of interactions seems to have an adverse effect.

Figure 3. Differences in students' development of externalizing behavior, based on staff-student interactions (±1 SD) and utilization intensity (±1 SD), controlling for individual and school level variables.



Discussion

In short, the lack of any main effects suggests that neither extended education utilization intensity, nor externalizing behavior in peers nor caregiver-student interactions alone affect change in externalizing behavior, negating hypotheses 1 to 3. However, in line with hypotheses 4a and 4b, we did find two cross-level interactions: Higher utilization intensity was more favorably linked to the development of externalizing behavior if caregiver-student interactions had a higher quality and if initial levels of externalizing behavior in peers were lower.

Utilization intensity alone does not seem to affect the development of externalizing behavior. This result confirms findings from a previous study in Switzerland (Schüpbach et al., 2014) and is also in line with the conclusion from Roth et al. (2010). While utilization intensity as a factor may potentially provide more information and thus be helpful in explaining different findings, rather than only considering mere participation, it seems reasonable to assume that any effects of extended education settings – no matter how intensively they are used – still depend on additional characteristics.

As previous research on child contagion suggested (Dishion & Tipsord, 2011), externalizing behavior in peers may influence the development of externalizing behavior. In our study, we could not confirm such a general notion. This may seem surprising, as students not only share extended education but also regular school hours with the respective peer group. However, regular school hours may be more firmly structured and supervised than extended education, which may counteract the possible effect of externalizing behavior within peer groups (Dishion & Tipsord, 2011).

Contrary to findings regarding after-school programs (Pierce et al., 2010; Wade, 2015), results did not indicate caregiver-student interactions having a general effect

on change in externalizing behavior. It is possible that overall utilization intensity was not strong enough to elicit such an effect, which would be supported by our finding of a cross-level interaction between the quality of caregiver-student interactions and utilization intensity.

To our knowledge, our contribution is the first to explore externalizing behavior in peers as a possible moderating factor of the effects of extended education. As expected, lower levels of externalizing behavior in peers predicted a more favorable relationship between utilization intensity and change in externalizing behavior: Students who experienced low levels of externalizing behavior among their peers developed more favorably, if they used extended education more intensively and the contrary was found when levels of externalizing behavior among peers were high. Consequently, for students with high utilization intensity, higher initial levels of externalizing behavior among peers were associated with an increase in externalizing behavior, compared to students with lower levels. So far, those results are in line with literature regarding peer contagion (Dishion & Tipsord, 2011). However, the development of externalizing behavior in students with low utilization intensity also differed. Among these students, higher levels of externalizing behavior among peers predicted a more favorable outcome, that is, a decrease in externalizing behavior. This finding is difficult to explain, especially since we could not find any influential outliers. In fact, inspection of the scatterplot indicated a strong linear relationship between externalizing behavior in peers and the slope between utilization intensity and change in externalizing behavior. Since it seems unlikely, that higher levels of externalizing behavior in peers would exert a favorable influence on the development of externalizing behavior, results point to confounded variables, either at the class or at the individual level.

Similar results emerged with regard to the cross-level interaction between quality of caregiver-student interactions and utilization intensity: For students with low quality of interactions, higher utilization intensity predicted an increase in externalizing behavior. In contrast, higher utilization intensity was linked to a decrease in externalizing behavior, when quality of caregiver-student interactions was high. Consequently, higher quality caregiver-student interactions were associated with a decrease in externalizing behavior, when extended education was utilized intensively. So far, results are in line with Wade (2015) who found that an after-school program resulted in an adverse effect when caregiver-student interaction quality was low. However – analogical to the other cross-level interaction – converse results were found for students with low utilization intensity, that is, with higher quality of caregiver-student interactions being linked to adverse outcomes. Again, such an effect seems unlikely and implies confounding variables, either at the school level or at the individual level.

Limitations

While the longitudinal multilevel design of our contribution allowed us to explore possible influences of change in externalizing behavior on their respective levels, there are several limitations: (1) With an average of only about 5 students per class

and about 10 students per school, sample size was already quite small, especially considering the small amount of variation at class- and school-levels. (2) Other relevant variables such as socioeconomic background or intelligence could not be included in analyses because they would have led to yet another reduction of sample size. (3) Ideally, the degree of externalizing behavior in peers would have been accounted for by including externalizing behavior at the end of grade 1 as latent predictor at the class level, because the simple aggregation variables of a lower cluster might bias standard errors. However, three-level models in MPlus do not allow predictors to be specified at more than one level. (4) Furthermore, the level-2 unit "classes" could refer both to a student's classmates and to his or her peers in the respective extended education setting. While consideration of externalizing behavior in all peers during extended education might be the most straightforward approach, our sample was limited to a few classes per school and did not represent all children utilizing extended education. Therefore, focusing on a student's classmates, which were also enrolled in extended education, seemed appropriate.

Conclusion

This contribution explored several possible moderators which may help to explain differential effects of extended education on externalizing behavior. Per se, utilization intensity, externalizing behavior in peers and caregiver-student interactions did not predict change in externalizing behavior. However, the effect of utilization intensity on externalizing behavior was moderated by both externalizing behavior in peers and caregiver-student interactions. While those findings generally confirm our assumption that utilization intensity has a favorable effect on externalizing behavior when the degree of externalizing behavior in peers is low and the quality of caregiver-student interactions is high, further inspection of both cross-level interactions raises caution. Further studies should reexamine those interactions in larger samples while controlling for additional characteristics at the individual, class, and school level (e.g. socioeconomic background, intelligence, quality of extended education beyond caregiver-student interactions), allowing for a more thorough inspection of possible confounders.

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