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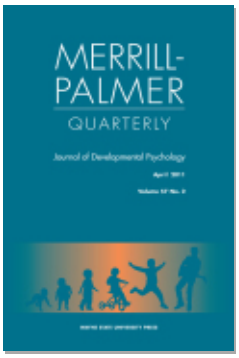
Competence, Problem Behavior, and the Effects of Having No Friends, Aggressive Friends, or Nonaggressive Friends: A Four-Year Longitudinal Study



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Competence, Problem Behavior, and the Effects of Having No Friends, Aggressive Friends, or Nonaggressive Friends

A Four-Year Longitudinal Study

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This study examined the longitudinal relations between competence (academic achievement and social preference) and problem behavior (loneliness and aggression) in 741 elementary school boys and girls in the Netherlands (Grades 1–5). Also, we examined the moderation effects of having no friends, aggressive friends, or nonaggressive friends on the associations between competence and problem behavior. Results revealed that competence was related to later problem behavior. Academic competence was related to lower levels of later loneliness, whereas social preference was related to both lower levels of loneliness and aggression over time. Vice versa, loneliness was not related to subsequent competence, whereas aggression was associated with later lower levels of social preference. Although group differences appeared on mean levels of competence and problem behavior, with children without friends being especially vulnerable to maladjustment, we found no moderation effects of friendship for associations between competence and problem behavior.

Two domains of competence are specifically important during the elementary school years: academic competence and social competence. Children

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who experience academic achievement problems early in childhood are at risk for dropping out of school later (e.g., Fetler, 1989) and delinquent behavior (e.g., Tremblay et al., 1992). Similarly, children who have problems with their social functioning have been shown to do worse in school and to display more behavioral problems (Campbell, 1994; Chen, Li, Li, Li, & Liu, 2000; Ladd, Kochenderfer & Coleman, 1996; Parker & Asher, 1993). In addition, two kinds of problem behaviors are particularly problematic in elementary school–aged children but nevertheless occur regularly: being lonely and acting aggressively. Research has shown that chronically lonely children are at risk for various types of maladjustment in adolescence and adulthood, such as depression, dropping out of school, medical problems, and alcoholism (Asher & Paquette, 2003). Likewise, aggression at an early age is known to be related to later peer rejection (e.g., Coie, Dodge, & Kupersmidt, 1990), antisocial behavior (e.g., Loeber, 1990), low academic achievement (e.g., Kokko & Pulkkinen, 2000), and risk-taking behavior (e.g., Brook & Newcomb, 1995).

The first aim of the present study was to examine how competence and problem behavior were concurrently and longitudinally related in children from 7 to 11 years of age. More specifically, associations between academic achievement and social preference (indicators of academic and social competence, respectively), and loneliness and aggression (indicators of problem behavior), were examined by using longitudinal cascade models. In longitudinal cascade models, it is proposed that functioning in one area spills over to influence functioning in another area. In the case of competence and problem behavior, competence might lead to problem behaviors. Such models are known in the literature as *failure models*, which assume that failure to learn, for example, social or academic skills, leads to vulnerabilities for future failure and adjustment problems when children need to cope with new challenges in life (e.g., Cicchetti & Schneider-Rosen, 1986). Alternatively, problem behavior can lead to incompetence. This is the case, for instance, when a child's problem behavior is so distractive that it puts that child's academic learning at risk. Along with Obradović, Burt, and Masten (2010), we argue that it is important to know more about directions, timing, and processes involved in such longitudinal effects because of their importance for intervention and developmental theory. In longitudinal cascade models, directional effects are estimated, over and above the covariance of multiple domains at one point in time, and the interindividual stability of these domains across times, which makes such models very well suited to investigate the hypothesized longitudinal relations between competence and problem behavior in this study.

Masten et al. (2005), using longitudinal cascade models, examined the associations between academic competence and problem behavior over a 20-year period, starting at age 7. Furthermore, Burt, Obradović, Long, and Masten (2008) mapped the longitudinal associations between social competence and problem behavior over a 20-year period. Masten and colleagues found support for a failure model. In their study on social competence and problem behavior, for example, they found that social competence at age 10 was linked to internalizing problems at age 17 (Burt et al., 2008; Obradović et al., 2010). Other researchers have found that social competence longitudinally predicts externalizing problem behavior in early and middle adolescence (Sørlie, Hagen, & Ogden, 2008). Academic competence has been linked to changes in problem behavior, as well. Academic failure has been found to be related to increased externalizing behavior (e.g., Dishion, Patterson, Stoolmiller, & Skinner, 1991; Williams & McGee, 1994) and changes in internalizing symptoms (e.g., Chen, Rubin, & Li, 1995; Maughan, Rowe, Loeber, & Stouthamer-Loeber, 2003). In short, academic and social functioning have been shown to be related to changes in later problem behaviors.

Problem behavior may be also related to changes in competence. Research provides mixed evidence for a relation between problem behavior and later incompetence. In accordance with other researchers (e.g., Risi, Gerhardstein, & Kistner, 2003), Masten and colleagues (2005) found that externalizing behaviors in childhood undermine academic competence by adolescence (see also Obradović et al., 2010). In addition, research also showed that externalizing problem behavior is negatively related to later social functioning (e.g., Dodge, Coie, & Lynam, 2006). The relation between internalizing problems and later academic competence, however, is somewhat less clear. Masten and colleagues, for example, found no support for the hypothesis that internalizing problem behavior leads to later academic or social incompetence (Burt et al., 2008; Masten et al., 2005). However, other researchers found that children who meet criteria for psychiatric diagnoses of internalizing problems suffer severe academic consequences (e.g., Bardone, Moffitt, Caspi, & Dickson, 1996). Whether this negative relation between internalizing and academic achievement also holds true for nonclinical samples is still unclear.

Thus, it seems that problem behavior may lead to changes in competence, depending on the kind of problem behavior studied. More specifically, externalizing problems may lead to changes in social and academic competence, whereas the relation between internalizing problems and competence is less clear.

The Moderating Role of Friendships

In the aforementioned studies, competence and problem behavior are seen as child characteristics, and little attention has been given to the context in which a child functions: for example, whether a child has friends and who those friends are (Hartup & Stevens, 1997). The present study aimed to examine whether the associations between competence and problem behaviors are different for children without friends, children with aggressive friends, and children with nonaggressive friends. In other words, we wanted to examine the moderating role of friendships on the relation between children's competence and problem behavior.

Theoretically, if moderation of friendship exists, friendship could have two contradictory outcomes. First, friendship might *protect* certain children from later maladjustment, thus weakening the negative associations between predictors and adjustment. This hypothesis is known in the literature as the *buffering hypothesis* of friendship (e.g., Boulton, Trueman, Chau, Whitehand, & Amatya, 1999). For example, the negative association between feelings of loneliness and later academic achievement may be weaker for children who have a best friend than for children who do not have a best friend. Second, friendship might *augment* later maladjustment for some children—that is, amplify positive associations between predictors and maladjustment. For instance, the stability of externalizing behavior may be higher for children with aggressive friends than for children with nonaggressive friends.

Research on the moderating role of friendship has been sparse and inconclusive. Some researchers concluded that friendship *buffered* against maladjustment. Hodges, Boivin, Vitaro, and Bukowski (1999), for instance, found that having a best friend eliminated the relation between victimization and increases in internalizing behavior 1 year later, and considerably reduced the relation between victimization and increases in externalizing behavior. The relation between victimization, on the one hand, and internalizing and externalizing behavior, on the other, persisted in children without a best friendship. Similarly, Laursen, Bukowski, Aunola, and Nurmi (2007) found that having friends (as opposed to being friendless) reduced the relation between social isolation in Grade 1 and internalizing and externalizing behavior in Grade 2. Recently, Erath, Flanagan, Bierman, and Tu (2010) found that having close friendships cross-sectionally moderated the relation between social anxiety and psychosocial maladjustment (e.g., loneliness, peer victimization, and low self-efficacy).

Other studies, however, have found that friendship *augmented* maladjustment. Kupersmidt, Burchinal, and Patterson (1995), for example,

concluded that having a mutual best friend actually placed rejected children at risk for externalizing behavioral problems instead of protecting them from maladjustment. Similarly, Hoza, Molina, Bukowski, and Sippola (1995) found that children who were aggressive and had a mutual friendship concurrently displayed relatively high levels of externalizing behavior. Longitudinally, however, these findings did not persist.

In addition, some studies failed to find any moderating effects of friendship. For example, La Greca and Harrison (2005), in a cross-sectional study, found strong positive main effects of victimization on feelings of depression and anxiety. However, no moderation effects of positive friendship quality or romantic relations were found for the association between (relational or overt) victimization and feelings of depression or anxiety. In addition, Greco and Morris (2005) found cross-sectionally that, although negative friendship quality exacerbated the relation between childhood anxiety and levels of peer acceptance for girls (but not boys), positive friendship quality and friendship quantity did not moderate this relation.

Research Questions and Hypotheses

The first aim of this study was to longitudinally map the associations between competence and problem behavior throughout elementary school. More specifically, academic achievement and social preference were used as indicators of academic and social competence, respectively, and loneliness and aggression were examined as indicators of problem behavior. Whereas previous studies have not always integrated multiple competencies in their studies (e.g. Burt et al., 2008; Masten et al., 2005), we argue that it is important to acknowledge that academic achievement and social preference are mutually related (Ladd, 1990; Ollendick, Weist, Borden, & Greene, 1992; Schwartz, Hopmeyer-Gorman, Nakamoto, & McKay, 2006) and therefore should be examined simultaneously in one model. In contrast to many studies on peer influence that have focused mostly on adolescents, high-risk samples (e.g., children from a background with low socioeconomic status), and more severe forms of disruptive behavior (e.g., antisocial behavior, substance use), we investigated the influence of friends in regular elementary school. Friends play an important role in a child's life much earlier than during adolescence, and these early friendship experiences set the stage for later friendship experiences. Furthermore, we wanted to examine whether peers can be of influence in other domains than the domains typically studied in adolescence (e.g., smoking, drinking, delinquency).

In accordance with the literature described, we expected that especially aggressive behavior would be positively predictive of later academic

achievement and negatively predictive of social preference, whereas both academic achievement and social preference would be negatively associated with both later loneliness and aggression.

Secondly, we examined the moderating effects of having no friends, aggressive friends, and nonaggressive friends on the concurrent and longitudinal associations between academic achievement, social preference, loneliness, and aggression. Based on the mixed findings in the existing literature on friendship moderation, these analyses were primarily exploratory. Nevertheless, it could be expected that, for example, a negative relation between social preference and loneliness would grow increasingly strong over time for children without friends when compared to children with aggressive or nonaggressive friends. Also, a negative relation between aggression and subsequent social preference may grow increasingly strong over time for children without friends and for children with aggressive friends when compared to children with nonaggressive friends.

Method

Participants

Participants were drawn from the Utrecht Social Development Project (USDP), a longitudinal study on the social development of elementary school children. In Grade 1, a total of 49 schools (71 classes) in the province of Utrecht and the city of Hilversum in the Netherlands participated in our study. After school boards gave active consent for their pupils to participate in this study, parents were informed about the study and were given the opportunity to refuse participation for their children. Lastly, it was made clear to the children that they could refuse or stop participating in our study at any time. Parents refused participation for 110 children (6.7%). Interviews were held with 1,241 children in Grade 1, and 60% of these children (741 children, 52% of whom were boys) participated at all three time points used in this study (Grade 1: *M* age = 6.8, *SD* = 5 months; Grade 3: *M* age = 8.9, *SD* = 4.5 months; Grade 5: *M* age = 10.9, *SD* = 4.5 months). Of these 741 children, 93% had Dutch parents, whereas the other children had at least one parent from Morocco, Turkey, Surinam, or a European country other than the Netherlands.

To examine whether the children who had data on all three waves (N = 741) differed from the children with incomplete data (n_{Grade1} = 423, n_{Grade3} = 273, and n_{Grade5} = 606) on our study variables, a multiple analysis of variance (MANOVA) was performed. As is often seen in longitudinal studies (e.g., Aseltine, 1995; Scaramella, Conger, Spoth, & Simons, 2002), the incomplete-data group differed on several study variables from the children

who had data on all waves. More specifically, in Grade 1, the children with incomplete data scored lower on social preference (F[1, 1106] = 24.105, p = .000, η_p^2 = .02) and academic achievement (F[1, 1106] = 84.594, p = .000, η_p^2 = .07) and were rated by their teachers to be more aggressive (F[1, 1106] = 22.437, p = .000, η_p^2 = .02) than the children with data on all waves. No differences between groups were found on loneliness.

Procedure

In Grades 1 and 3, children were individually interviewed by trained research assistants in a quiet environment outside the classroom. The research assistants stressed the confidentiality of the study several times. Child interviews provided information on the social relations of the children with their classmates and on feelings of loneliness, as well as several peer nomination measures on, for example, aggression and prosocial behavior. This peer nomination procedure was as follows: Pictures were taken of all children in the study, and when the interviewer posed a question, children could point at the pictures of those children they wanted to nominate. Children could nominate an unlimited number of same-sex and opposite-sex classmates on all nomination questions. They were not obliged to nominate someone but were not allowed to nominate themselves.

In Grade 5, children filled out questionnaires consisting of peer nominations on social relations and problem behavior, and self-reports on feelings of loneliness and self-worth and on several behavioral difficulties. The peer nomination procedure involved handing children a list with names of all their classmates. Children could write down the names of the classmates they wanted to nominate for a specific question. Rules for nominating were similar in all grades. Children completed questionnaires during class hours, in two sessions, on separate days. Two research assistants were present in the classroom to give instructions, stress the confidentiality of the study, and answer questions.

Additionally, teachers completed a short questionnaire for every child in their class about, for instance, problem behavior and children's grade point average (GPA) at all three time points.

Measures

The present study used multiple informants. Academic achievement was based on children's GPA, social preference was based on peer nominations, loneliness was based on self-reports, and aggression was based on teacher reports.

Academic achievement. A child's academic achievement was measured by their GPA (1–10) of nine school domains: language, arithmetic, vocabulary, reading, drawing, physical education, arts and crafts, autonomy, and learning ability. A child's academic achievement was operationalized as the mean performance score on these nine domains (Cronbach's αs $\geq$.86).

Social preference. Social preference was measured by a peer nomination procedure described by Coie and Dodge (1983). Rejection scores (the number of times a child was negatively nominated—"don't like to play with"—standardized within class) were subtracted from acceptance scores (the number of times a child was positively nominated—"like to play with"—standardized within class). Resulting difference scores were again standardized within class to obtain social preference scores.

Loneliness. The Loneliness and Social Dissatisfaction Questionnaire (LSDQ; Asher, Hymel, & Renshaw, 1984; Asher & Wheeler, 1985) was used as an indicator of loneliness. The LSDQ is a self-report measure that contains 16 target items (α_{G1} = .71, α_{G3} = .81, and α_{G5} = .88) on feelings of loneliness and social dissatisfaction (e.g., "I'm lonely"), and 8 items on preferred activities or hobbies (e.g., "I like to paint and draw"). Individual scores were obtained by calculating the mean scores of the 16 target items. Scores were standardized within wave, and thereafter standardized across waves, to deal with differences in answer categories between waves (1 = *never true* to 3 or 5 = *always true*). In this way, relative differences in variability across time and grouping structure were preserved (see also Stright, Gallagher, & Kelley, 2008). Higher scores indicated more feelings of loneliness.

Aggression. Teachers completed the subscale Aggression of the Amsterdam Child Behavior Checklist (ACBC; De Jong, 1995) for every child in their class. The ACBC is a short teacher rating scale designed to differentiate between attention problems and related behavioral and emotional problems observed frequently in primary school children. The subscale Aggression consisted of six items (e.g., "often destroys things"), and teachers rated on a 4-point scale how well the items described the children in their class (1= *not* to 4 = *well*). Individual scores were obtained by calculating the mean subscale score, higher scores indicating more aggression (Cronbach's α for each wave was $\geq$.89).

Identification of Friends in Grade 1

For the identification of friendships we used *best friend* peer nominations. Children were asked to identify their best friends, and two children were

considered best friends if they nominated each other. Children could nominate an unlimited number of same-sex and other-sex classmates.

Aggression of children's friends was assessed by using four items of the Perception of Peer Support Scale (PPSS). Items in the original PPSS (e.g., Kochenderfer & Ladd, 1996) were adapted to serve as a peer nomination measure of peer aggression. That is, children were asked to indicate which children in their class (1) "pick on you at school," (2) "hit you at school," (3) "say mean things to you at school," or (4) "say bad things to other kids in school behind your back." To obtain an individual score of aggression, the mean number of nominations received on the four items was calculated and then standardized within class. Higher scores indicated higher levels of aggression (Cronbach's $\alpha = .85$).

Constructing Friendship Groups

Children in Grade 1 were assigned to one of three groups: (1) children without reciprocated best friendships (n = 199), (2) children with mainly nonaggressive friends (n = 363), and (3) children with mainly aggressive friends (n = 179). Friends who had an aggression score (on the PPSS) within the top 33% were labeled as being aggressive (see also Rubin, Wojslawowicz, Rose-Krasnor, Booth-LaForce, & Burgess, 2006). If more than 50% of the friends of a child were aggressive in Grade 1, the child was assigned to the group with mainly aggressive friends. If 50% or less than 50% of the friends were aggressive, the child was assigned to the group with mainly nonaggressive friends.

Plan of Analysis

Our first research question was to examine how the two measures of competence (academic achievement and social preference) are concurrently and longitudinally related to the two measures of problem behavior (loneliness and aggression). A series of nested cascade models were tested by using longitudinal path analyses in Mplus version 5.0 (Muthén & Muthén, 1998–2007). The absolute fit of the models was assessed by several fit indices: The overall goodness of fit of the model was estimated with the root mean square error of approximation (RMSEA) and the comparative fit index (CFI). Good-fitting models yield a value greater than .95 on the CFI, whereas values between .90 and .95 imply an acceptable fit. Further, RMSEA values of less than .05 are considered to indicate a good fit, with values between .05 and .08 indicating a fair fit. In all models, concurrent correlations between constructs were included. Model 1 is the continuity

model, in which only continuity paths from constructs from Grade 1 to Grade 3, from Grade 3 to Grade 5, and from Grade 1 to Grade 5 are estimated. In all other models, these continuity paths are also included, but these models are extended by diagonally directed paths specifying various cascade effects at both time intervals. Model 2 includes eight cross-lagged paths from problem behavior to competence, Model 3 adds eight cross-lagged paths from competence to problem behavior, Model 4 additionally includes four cross-lagged paths between the two measures of competence, and Model 5 finally adds four cross-lagged paths between the two measures of problem behavior and thus includes all possible cross-domain paths (full cascade model). Each of the more parsimonious models was compared with the next, more complex, model by examining the relative fit of the models by using χ^2-difference tests. In case of no significant χ^2 difference, the more parsimonious model was chosen.

To explore possible gender differences in the concurrent and longitudinal relations between competence and problem behavior, multiple-group analyses were performed. Restricted and nonrestricted two-group moderation models were tested in the best-fitting longitudinal model. In the restricted model, all path coefficients (concurrent correlations, longitudinal stability paths, and cross-lagged paths) were specified to be equal across groups. In the nonrestricted model, path coefficients were free to vary across groups. In case of moderation, constraining path coefficients should result in a significant decrease in model fit when compared to the unconstrained model.

Next, we conducted repeated-measures analyses with Bonferroni post hoc tests to examine whether boys and girls without friends, with nonaggressive friends, and with aggressive friends showed differences in their *mean levels* of academic achievement, social preference, loneliness, and aggression over the three time points. In these analyses, friendship group and gender were between-subject factors. Lastly, multiple-group analyses were performed to examine the moderating effects of having no friends, nonaggressive friends, or aggressive friends in Grade 1 on the concurrent and longitudinal *associations* between academic achievement, social preference, loneliness, and aggression (second research question).

Results

Descriptive Statistics

Table 1 lists the intercorrelations, stability, means, and standard deviations of all measures in Grades 1, 3, and 5 for boys and girls. Stability coefficients

Table 1. Intercorrelations, Stability, Means, and Standard Deviations of All Constructs in Grades 1, 3, and 5 for Boys and Girls

	Grade 1				Grade 3				Grade 5					
Variable	1	2	3	4	1	2	3	4	1	2	3	4	*M*	*SD*
Grade 1														
1. Loneliness	—	−.02	−.11*	.02	**.27*****	.02	−.15**	.04	**.20*****	.08	−.11*	−.03	.00	.41
2. Academic achievement	−.10	—	.21***	−.11*	−.09	**.54*****	.17**	−.08	−.20***	**.47*****	.13*	−.14**	7.14	.71
3. Social preference	−.18**	.26***	—	−.37***	−.22***	.19***	**.58*****	−.32***	−.21***	.20***	**.40*****	−.33***	.01	1.02
4. Aggression	.06	−.14**	−.21***	—	.16**	−.06	−.27***	**.49*****	.11*	−.12*	−.28***	**.48*****	1.46	.58
Grade 3														
1. Loneliness	**.18*****	−.25***	−.21***	.10	—	−.02	−.26***	.16**	**.28**	.03	−.18***	.01	.01	.42
2. Academic achievement	−.03	**.55*****	.19**	−.07	−.12*	—	.14**	−.08	.13*	**.61*****	.13*	−.08	7.29	.66
3. Social preference	−.06	.31***	**.46*****	−.24***	−.19***	.31***	—	−.34***	−.25***	.14**	**.58*****	−.28***	.02	.99
4. Aggression	−.02	−.07	−.16**	**.37*****	.04	−.11	−.18**	—	.17**	−.13*	.36***	**.47*****	1.48	.58
Grade 5														
1. Loneliness	**.24*****	−.25***	−.20***	.16**	**.30*****	−.25***	−.26***	.19**	—	−.10	−.32***	.04	.03	.42
2. Academic achievement	−.01	**.53*****	.11*	−.08	.12*	**.62*****	.30***	−.09	−.21***	—	.18***	−.22***	7.25	.70
3. Social preference	−.13*	.19***	**.43*****	−.21***	−.19***	.22***	**.49*****	−.15**	.32***	.26***	—	−.31***	−.02	1.00
4. Aggression	−.06	−.11*	−.07	**.16****	.03	−.05	−.19***	**.35*****	.13*	−.14**	−.10	—	1.43	.55
M	.03	7.18	.22	1.23	.02	7.31	.13	1.23	.03	7.37	.22	1.18		
SD	.43	.66	.80	.38	.41	.62	.84	.36	.44	.70	.87	.30		

Note. Boldface correlations are the stability coefficients of each measure: boys are above the diagonal, and girls are below the diagonal.

*$p < .05$. **$p < .01$. ***$p < .001$.

for academic achievement, social preference, and aggression are moderate to high for both boys and girls (ranging from .35 to .62), with stability coefficients for social preference and aggression slightly higher for boys than for girls. Stability coefficients for loneliness were moderate for both boys and girls (ranging from .18 to .30).

Associations Between Competence and Problem Behavior

Table 2 lists the results for the relative and absolute model fit for the longitudinal analysis of the association between academic achievement and social preference and loneliness and aggression. The χ^2-difference tests showed that Model 5 fitted the data significantly better than the four more parsimonious models (Models 1–4) and was therefore adopted as the final model ($\chi^2 = 24.854$, $df = 12$, CFI = .99, RMSEA = .038).

Concurrent associations revealed that social preference was negatively correlated with loneliness in all grades, negatively correlated with aggression in Grades 1 and 3, and positively correlated with academic achievement in all grades (see Figure 1). In Grades 1 and 5, academic achievement was also negatively related to aggression.

Results further showed that all stability paths from Grade 1 to Grade 3 and from Grade 3 to Grade 5 were positive and significant, and strong for academic achievement and social preference (ranging from .40 to .53), moderately strong for aggression (.42 and .32 respectively), and less strong for loneliness (ranging from .20 to .21). Stability paths from Grade 1 to Grade 5 ranged from .15 for social preference and loneliness to .23 and .26 for academic achievement and aggression, respectively.

Examination of the longitudinal associations between competence and later problem behavior demonstrated that academic achievement was negatively predictive of subsequent loneliness (but not of aggression). Children who achieved better in school were less lonely 2 years later. In addition, for both time intervals, results revealed significant negative relations between social preference and aggression and loneliness. Being better liked by one's peers was consistently related to lower levels of loneliness and aggression 2 years later.

Vice versa, the longitudinal associations from problem behavior to competence showed that loneliness was not predictive of subsequent academic achievement or social preference. However, significant negative relations between aggression and subsequent social preference were found at both time intervals. Children who initially displayed high levels of aggression were subsequently less liked by their peers. Aggression was not significantly related to later academic achievement.

Table 2. Fit Statistics and Model Comparisons for Proposed Nested Models

Model				Absolute fit statistics				Difference test of relative fit			
	Description of paths added to the model	*df*	χ^2	CFI	TLI	RMSEA	SRMR	Comparison	Δdf	$\Delta\chi^2$	*p*
1	Stability model	36	200.416	.913	.854	.079	.083				
2	Problem behavior → competence	28	163.704	.928	.845	.081	.073	2 vs. 1	8	36.712	.000
3	Competence → problem behavior	20	64.406	.976	.929	.055	.036	3 vs. 2	8	99.298	.000
4	Cross-paths competence	16	41.784	.986	.949	.047	.022	4 vs. 3	4	22.622	.000
5	Cross-paths problem behavior	12	24.854	.993	.966	.038	.014	5 vs. 4	4	16.930	.002

Note. CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

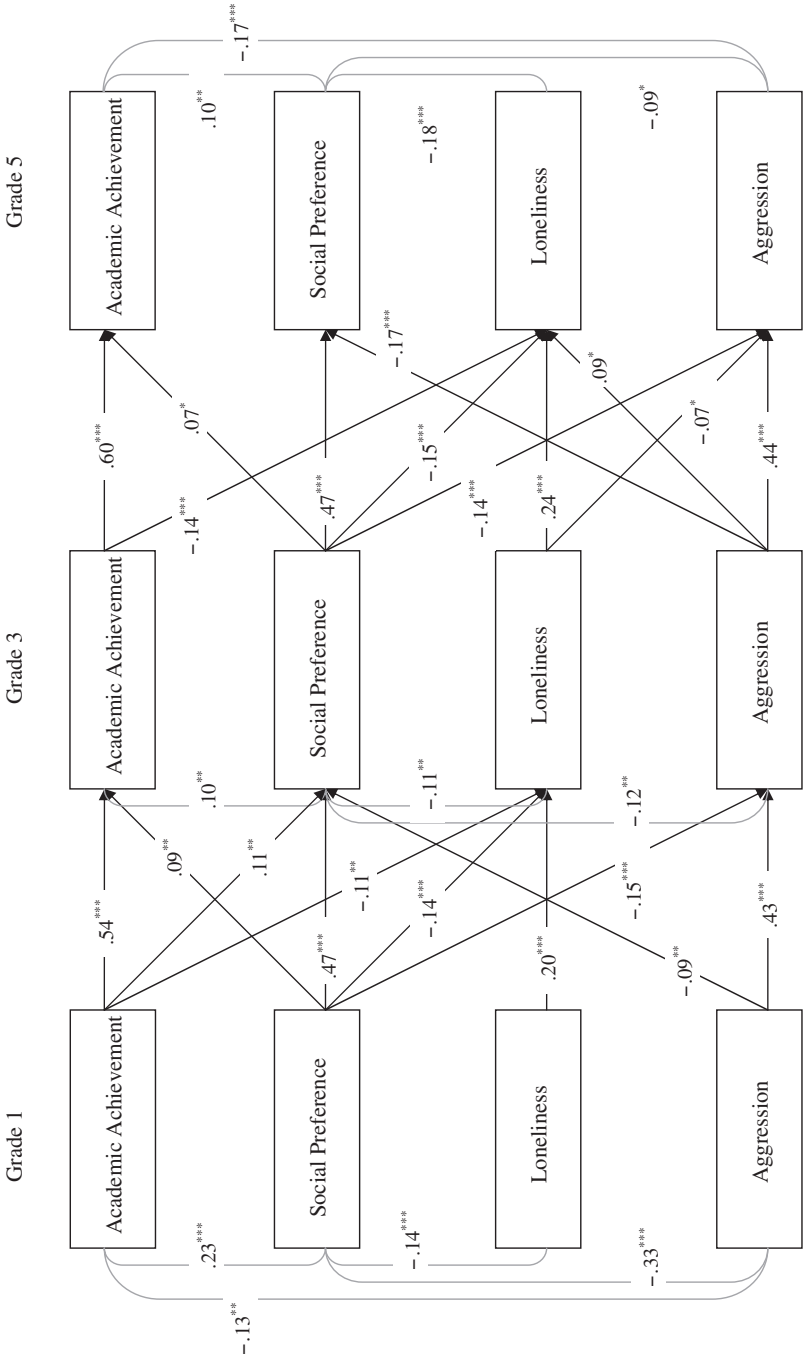

Figure 1. Standardized paths coefficients for significant paths: $*p < .05$; $**p < .01$; $***p < .001$.

Examination of longitudinal relations between the two domains of competence showed that academic achievement was predictive of later social preference in younger children (from Grade 1 to Grade 3); thus, for these children, doing better in school was predictive of them being liked by their peers. Social preference among younger children was predictive of later academic achievement. That is, children who are better liked by their peers in Grade 1 performed better in school 2 years later.

Finally, the examination of longitudinal relations between the two domains of problem behavior showed that loneliness was predictive of later aggression, and aggression was predictive of later loneliness, from Grade 3 to Grade 5. Thus, children who are lonely in Grade 3 are subsequently less aggressive in Grade 5, and children who display high levels of aggression in Grade 3 subsequently report being more lonely in Grade 5. Associations between the two problem behaviors were not found from Grade 1 to Grade 3.

Gender Differences

To examine whether associations between competence and problem behavior over time differed for boys and girls, multiple-group analyses were performed on Model 5. Constraining all parameter estimates (stability paths, cross-lagged paths, and concurrent correlations) to be equal across groups resulted in significant decreases in model fit ($\Delta\chi^2 = 126.52$; $\Delta df = 54$; $p < .001$), which indicates the existence of gender differences. We first allowed continuity paths to differ for boys and girls. Releasing these parameters led to significant increases in model fit ($\Delta\chi^2 = 47.57$; $\Delta df = 12$; $p < .001$). Gender differences were found in aggression (stronger for boys than girls) and social preference (stronger for girls than boys) on stability paths from Grade 1 to Grade 5. Consequently, these paths were not constrained to be equal across gender, whereas all other continuity paths were constrained to be equal for boys and girls. Secondly, releasing paths from competence to problem behavior ($\Delta\chi^2 = 12.361$; $\Delta df = 8$, $p = .136$), paths from problem behavior to competence ($\Delta\chi^2 = 11.916$, $\Delta df = 8$; $p = .155$), and paths between the two measures of competence ($\Delta\chi^2 = 7.613$, $\Delta df = 4$, $p = .107$) did not lead to significant increases in model fit. As a result, all these paths were constrained to be equal across groups. Next, releasing paths between the two measures of problem behavior led to a significant increase in model fit ($\Delta\chi^2 = 9.817$, $\Delta df = 4$; $p = .04$). Gender differences appeared on the positive association from Grade 3 aggression to Grade 5 loneliness, which was stronger for girls than for boys. Lastly, the concurrent correlations were freed to be different for boys and girls, which again led to a significant

increase in model fit ($\Delta\chi^2 = 42.078$; $\Delta df = 18$; $p = .001$). The negative relation between social preference and aggression in Grade 3 was stronger for boys than for girls. All other correlations did not differ between groups and were thus constrained to be equal for all groups. The final model showed good fit to the data ($\chi^2 = 105.226$, $df = 74$, CFI = .98, RMSEA = .034).

Friendship Analyses

Before examining possible group differences (children without friends, children with aggressive friends, and children with nonaggressive friends) in *associations* between competence and problem behavior over time, we first charted the group differences in *mean* levels of competence and problem behavior from Grade 1 to Grade 5 by using repeated-measures analyses of variance (ANOVAs) with friendship group and gender as between-subject factors. Means and standard deviations are listed in Table 3.

Results showed a significant change in mean levels over time for academic achievement ($F[2, 623] = 22.123$, $p = .000$, $\eta_p^2 = .07$) and for aggression ($F[2, 616] = 3.401$, $p = .034$, $\eta_p^2 = .01$). Academic achievement increased from Grade 1 to Grade 3 and remained stable from Grade 3 to Grade 5 (Grade 1: $M = 7.10$; $SD = .03$; Grade 3: $M = 7.28$; $SD = .03$; Grade 5: $M = 7.29$; $SD = .03$), and aggression in Grade 1 was higher than in Grade 5 (Grade 1: $M = 1.40$; $SD = .02$; Grade 3: $M = 1.38$; $SD = .02$; Grade 5: $M = 1.33$; $SD = .02$). No change over time was found for mean levels of social preference and loneliness.

Further, significant main effects of friendship group were found for social preference ($F[2, 732] = 35.316$, $p = .000$, $\eta_p^2 = .09$), loneliness ($F[2, 733] = 7.976$, $p = .000$, $\eta_p^2 = .02$), and aggression ($F[2, 616] = 12.308$, $p = .000$,$\eta_p^2 = .04$). Post hoc analyses showed that children without friends ($M = –.28$; $SD = .05$) were less liked by their peers than children with aggressive friends ($M = .18$; $SD = .07$) or nonaggressive friends ($M = .26$; $SD = .04$). Also, children without friends ($M = .09$; $SD = .02$) were more lonely than children with aggressive friends ($M = –.02$; $SD = .03$) or nonaggressive friends ($M = .00$; $SD = .02$), and children without friends ($M = 1.45$; $SD = .03$) scored higher on aggression than children with nonaggressive friends ($M = 1.27$; $SD = .02$). No differences of friendship group were found for levels of academic achievement.

Significant main effects for gender were found for aggression ($F[2, 616] = 40.829$, $p = .000$, $\eta_p^2 = .06$) and social preference ($F[2, 732] = 8.057$, $p = .005$, $\eta_p^2 = .01$). Boys ($M = 1.48$; $SD = .02$) were more aggressive than girls ($M = 1.25$; $SD = .03$), whereas girls ($M = .15$; $SD = .05$) were better

Table 3. Means and Standard Deviations of All Constructs for Boys and Girls in Three Friendship Groups

	No friends				Nonaggressive friends				Aggressive friends			
	Boys		Girls		Boys		Girls		Boys		Girls	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Loneliness												
Grade 1	.08	.45	.12	.45	–.05	.39	.01	.41	–.01	.40	–.09	.44
Grade 3	.08	.48	.04	.44	.02	.39	.01	.40	–.05	.38	.03	.35
Grade 5	.13	.56	.10	.49	.00	.34	.00	.43	–.02	.37	.03	.38
Academic Achievement												
Grade 1	7.08	.66	7.09	.65	7.19	.81	7.24	.66	7.14	.66	6.99	.60
Grade 3	7.19	.66	7.27	.63	7.37	.70	7.35	.62	7.29	.61	7.13	.62
Grade 5	7.15	.70	7.32	.72	7.36	.70	7.40	.70	7.23	.70	7.34	.67
Social Preference												
Grade 1	–.59	1.05	–.17	.84	.31	.82	.38	.74	.16	.99	.26	.72
Grade 3	–.41	1.06	–.08	.98	.26	.85	.21	.92	.10	.96	.17	.80
Grade 5	–.38	1.04	–.03	1.01	.11	.93	.32	.81	.11	.97	.27	.71
Aggression												
Grade 1	1.58	.68	1.27	.46	1.39	.50	1.20	.32	1.44	.57	1.38	.41
Grade 3	1.70	.68	1.31	.40	1.37	.46	1.20	.33	1.44	.58	1.28	.37
Grade 5	1.57	.68	1.18	.33	1.36	.48	1.16	.26	1.39	.48	1.32	.45

liked by their peers than were boys (M = –.04; SD = .04). No main effects for gender were found for academic achievement and loneliness.

A significant interaction effect of Time × Friendship group was found for social preference (F[2, 732] = 3.550, p = .007, η_p^2 = .01). Children without friends became somewhat better liked by their peers (Grade 1: M = –.38; SD=.06; Grade 3: M = –.25; SD =.07; Grade 5: M = –.21; SD =.07), whereas children with aggressive friends (Grade 1: M =.21; SD =.09; Grade 3: M =.014; SD =.09; Grade 5: M =.19; SD =.09) or nonaggressive friends (Grade 1: M = .34; SD =.05; Grade 3: M =.23; SD =.05; Grade 5: M = .21; SD =.05) became somewhat less liked by their peers from Grade 1 to Grade 5. Further analyses revealed that for children with aggressive friends the level of social preference did not change significantly over time, whereas for children with nonaggressive friends the level of social preference decreased from Time 1 to Time 2 (but stayed stable from T2 to T3). In contrast, the level of social preference increased from T1 to T2 for children without friends (and was stable from T2 to T3). That is, from Grade 3 to Grade 5, the change over time in social preference was equal (and nonsignificant) in all three groups. From Grade 1 to Grade 3, however, children without friends became better liked by their peers, and children with nonaggressive friends became somewhat less liked by their peers. For academic achievement, loneliness, and aggression, no significant Time × Friendship group interactions were found, which means that the change in these variables over time did not differ significantly between the friendship groups.

No significant interaction effects of Time × Gender were found. Changes over time in academic achievement, social preference, aggression, and loneliness did not differ for boys and for girls.

A significant interaction effect of Friendship group × Gender was found for aggression (F[2, 616] = 5.056, p = .007, η_p^2 = .02). Girls without friends are similar in their levels of aggression as girls with (aggressive or nonaggressive) friends, whereas boys without friends are more aggressive friends (M = 1.64; SD =.04) than boys with aggressive friends (M = 1.43; SD =.03) or nonaggressive friends (M = 1.37; SD =.04). No significant interaction effects of friendship group × gender were found for academic achievement, social preference, and loneliness. Lastly, three-way-interactions of Time × Friendship group × Gender were not significant for all measures of competence and problem behavior.

To examine whether *associations* between competence and problem behavior over time differed for the three friendship groups, multiple-group analyses were performed on Model 5. Constraining all parameter estimates (stability paths, cross-lagged paths, and concurrent correlations) to

be equal across groups resulted in significant decreases in model fit ($\Delta\chi^2$ = 149.76; Δdf = 100; $p < .001$), which indicates the existence of group differences. Releasing continuity paths ($\Delta\chi^2$ = 15.489; Δdf = 16; $p <$ .001), paths from competence to problem behavior ($\Delta\chi^2$ = 16.621; Δdf = 16, p =.411), paths from problem behavior to competence ($\Delta\chi^2$ = 23.227, Δdf = 16; p =.108), paths between the two measures of competence ($\Delta\chi^2$ = 10.042, Δdf = 8, p =.262), and paths between the two measures of problem behavior ($\Delta\chi^2$ = 7.991, Δdf = 8; p =.434) did not lead to significant increases of model fit. As a result, all these paths were constrained to be equal across groups. Lastly, the concurrent correlations were freed to be different for the three groups, which led to a significant increase in model fit ($\Delta\chi^2$ = 81.828; Δdf = 36; $p < .001$). Examining confidence intervals revealed differences in correlations between social preference and aggression within Grade 1 and Grade 3. In Grade 1, the negative association between social preference and aggression was stronger for children without friends and for children with aggressive friends than for children with nonaggressive friends, and in Grade 3 this negative relation between social preference and aggression was stronger for children without friends than for children with nonaggressive friends. All other correlations did not differ between groups and were thus constrained to be equal for all groups. The final model showed adequate fit to the data (χ^2 = 185.225, df = 140, CFI = .97, RMSEA = .036[1]).

Discussion

This study aimed to chart the concurrent and longitudinal relations between academic achievement and social preference (competencies) and loneliness and aggression (problem behaviors). In addition, the effects of having no friends, nonaggressive friends, and aggressive friends on these longitudinal associations were examined. Our results foremost showed that, for boys and girls, competence is related to subsequent problem behavior more strongly than problem behavior is predictive of later competence. These findings are in line with the literature on failure models that, for example, state that failure to learn social or academic skills leads to vulnerabilities

1. Because the dichotomization (i.e., aggressive vs. nonaggressive friends) results in loss of information, additional analyses were conducted using a continuous moderator of friends' aggression (i.e., the mean score on aggression of all mutual best friends of a child in Grade 1). Eight regression analyses were performed (four criterion variables for each of two waves) that included interaction terms with friend's aggression. Results revealed no significant interaction effects, confirming that friends' aggression (also when defined as a continuous variable) did not moderate relations between measures of competence and problem behavior.

for future failure and adjustment problems when children need to cope with new challenges in life (e.g., Cicchetti & Schneider-Rosen, 1986).

A distinctive example of the failure model can be found in our results. Boys and girls who were aggressive in Grade 1 are subsequently less liked by their peers in Grade 3 and, in turn, experience higher levels of loneliness in Grade 5. Researchers have referred to this finding as the *coercion dual failure model* (Cole, 1990, 1991; Masten et al., 2005; Patterson & Capaldi, 1990), in which antisocial behavior leads to social problems that, in turn, contribute to depression and other internalizing problems (e.g., Capaldi, 1992). Although various studies have shown that children's aggression can lead to peer relation problems (e.g., Coie et al., 1990) and that peer relation problems can lead to loneliness (e.g., Parker & Asher, 1993), the present study adds to these findings in that it confirms that the use of cascade models is very important because they can provide us with a more complete picture of how multiple domains of competence and problem behaviors are related over time.

The two measures of competence were differently related to problem behavior in that academic achievement was solely subsequently related to lessened feelings of loneliness, whereas social preference was related to both later loneliness and later aggression. These findings hold for boys and girls and implicate that the social context, in addition to the academic context, plays a critical role in children's adjustment in elementary school, as has been acknowledged by others (e.g., Rubin, Bukowski, & Parker, 2006).

Whereas loneliness and aggression were not significantly related cross-sectionally and longitudinally from Grade 1 to Grade 3, they were related from Grade 3 to Grade 5 for boys and girls. Loneliness seems to inhibit the display of aggressive behaviors 2 years later, a process that has been suggested by other researchers (e.g., Moffitt, Caspi, Harrington, & Milne, 2002). Mesman, Bongers, and Koot (2001), for example, also found negative relations over time between internalizing and later externalizing behavior. They posit that the temperamental predisposition of children who show internalizing problems may prevent them from expressing uninhibited externalizing behaviors, such as aggression.

Vice versa, aggression was positively predictive of later loneliness, and this association was stronger for girls than for boys. The literature on this association between early aggression and subsequent loneliness provides mixed results. Mercer and DeRosier (2008) found that aggression was not related to subsequent self-reported loneliness. Similarly, Masten and colleagues did not find a relation between aggression and later internalizing behaviors (Burt et al., 2008; Masten et al., 2005). However, in accordance with our findings, Mesman et al. (2001) did find that

externalizing behavior was related to subsequent internalizing behavior. They reason that early disruptive behavior may represent a nonspecific precursor of a range of problems when children grow older. In other words, it may reflect a difficult temperament, which can lead to various problems later in childhood.

In addition, the two measures of competence were related both cross-sectionally and longitudinally (in younger children), which stresses the importance of assessing *multiple* domains of competence and problem behavior in one model. Another conclusion that can be drawn from these findings is that very few gender differences appeared on the longitudinal associations between competence and problem behavior.

Moderating Effects of Friends

The literature on peer influence in at-risk samples suggests that children with deviant friends are more at risk for later adjustment problems than are children with nondeviant friendships (e.g., Dishion, 2000). Also, the literature on children without friends suggests that these children are more prone to later maladjustment than are other children (e.g., Ladd, 1990; Renshaw & Brown, 1993). Comparisons of means showed that children without friends displayed *higher* levels of loneliness and *higher* levels of aggression, as well as *lower* levels of social preference. Friendship, however, did not buffer or augment the longitudinal relation between competence and problem behavior. In other words, no evidence was found for a moderating role of friendship on the relation between academic achievement and social preference, and loneliness and aggression. Research on friendship moderation has found mixed evidence for a moderating role of friendship, and our results agree with those in the studies that also failed to find evidence for friendship moderation (Greco & Morris, 2005; La Greca & Harrison, 2005).

Several possible factors could account for this lack of moderation in our study. Firstly, the subjects of the current study were drawn from a nonrisk sample, implying that their levels of aggression (and thus also their friend's levels of aggression) would best be characterized as being moderate. Most studies that found influence effects of deviant peers on children's behavior studied more severe forms of disruptive behavior (e.g., Dishion, 2000). It may be that children are influenced by their friends solely in cases of more extreme deviant behavior. Secondly, it may be that the influence of peers in middle childhood is not as strong as it is in adolescence and that other factors have a greater effect on the adjustment of children (e.g., parents; individual characteristics). Thirdly,

our research design had 2-year intervals between measurements. It might be that the friendship does moderate the relation between child characteristics and adjustment in the short term, but that these moderating effects fade away when these associations are examined in the longer term. Assessing the durability of friendship influence more precisely seems an important point for future research. Fourthly, we studied longitudinal relations between measures of competence and problem behavior. Studies that did find moderating effects of friendship focused on other associations; for example, they often included the effects of victimization (e.g., Hodges et al., 1999). That is, friendship might buffer against maladjustment in only particular cases.

It thus seems that friendship buffers against maladjustment in some cases but not in others. Since only few studies have examined the moderating role of friendship in very different domains, age groups, and samples, more research is needed to specify more precisely under which circumstances friendship does influence a child's adjustment.

Another interesting point that evolves from our findings is that the two dimensions of friendship—namely, (1) having friends versus not having friends and (2) having aggressive friends versus having nonaggressive friends—resulted in different findings. Children *without* friends seem to be more at risk for maladjustment than are children with *aggressive* friends. Boys (but not girls) without friends showed higher levels of aggression than did boys with nonaggressive or aggressive friends. Boys and girls without friends furthermore displayed higher levels of loneliness and social incompetence than did children with aggressive and nonaggressive friends. From Grade 1 to Grade 3, although children with aggressive or nonaggressive friends became somewhat less liked by their peers, and children without friends became somewhat better liked by their peers, children without friends did not reach similar high levels of social preference as children with friends. This finding has important implications for future research. Whereas a lot of research and intervention focuses on having deviant (antisocial) friends, our study shows that children who are unable to make and keep friends should gain our attention because they seem to be most at risk. It should be noted, though, that our findings generalize to children in regular elementary schools, and that having deviant friends in high-risk samples (e.g., friends who display more severely antisocial behavior) is very likely to have more impact on children's own adjustment (see Dishion, Spracklen, Andrews, & Patterson, 1996).

The finding that changes in social preference were found only from Grade 1 to Grade 3, and not from Grade 3 to Grade 5, seems to reflect the consolidation of social status during the elementary school years. In the

earlier years of elementary school, it seems that status is somewhat unstable, whereas, as children know each other longer, status becomes more stable, as reflected in the stability found from Grade 3 to Grade 5. This pattern has been reported in the literature before (for a meta-analysis on the stability of social preference at different ages, see Lu Jiang & Cillessen, 2005,).

This study has several limitations. Firstly, attrition in all waves was not random. Attrition analyses revealed that children who did not have data on all three waves demonstrated higher levels of aggressive behavior and lower levels of social preference and academic achievement. With respect to our friendship analyses, this might have accounted for the lack of moderating effects of having aggressive friends, because the most aggressive children did not have complete data. However, in the repeated-measures analyses, we did find effects of friendship groups, which indicates that there is enough variance to be explained in our measures to find group differences.

Furthermore, although friendship is commonly operationalized as a reciprocal relation (i.e., mutual nominations are required), recently, researchers have argued that it may not be reciprocated friendships that most strongly influence children's behavior, but that *un*reciprocated friendships have a greater impact on children's changes in behavior (Adams, Bukowski, & Bagwell, 2005; Bukowski, Velasquez, & Brendgen, 2008). The reason is that friendless children might be more motivated to be like the peer whom they would like to be friends with. In the present study, only reciprocated friendships were included, and therefore we may not necessarily have focused on the most influential peers in children's environment. In line with this argument, it must be mentioned that focusing solely on the school environment results in the exclusion of possibly influential peers outside the school context. In addition, that friendship quality might also be an influence should be considered when studying moderating effects of friendship (for example, see Rubin et al., 2004). We were not able to include friendship quality as a moderating variable in our study, but it seems commendable to account for friendship quality and reciprocity in future studies.

Despite these limitations, the present study is also characterized by several strengths, such as the use of multiple informants, the 4-year longitudinal design, the large sample, the inclusion of two measures of competence and problem behavior in one model, and the inclusion of two dimensions of friendship in one model. Results stress the importance of academic functioning and certainly also social functioning for children in elementary schools. Our findings indicate that friendship does not augment the relation between competence and problem behavior in this nonrisk

sample; that is, we found no moderation effects of friendship. Nevertheless, our findings show that not having friends is a greater risk factor than is having aggressive friends.

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