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## **Origins and predictors of friendships in 6- to 8-year-old children born at neonatal risk**

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**List of abbreviations:** GA: gestational age; VP: very preterm; FT: full-term; SES: socioeconomic status; PIRI: Parent-Infant Relationship Index; TOMI-H: Test of Motor Impairment - Henderson Revision; K-ABC: Kaufman - Assessment Battery for Children; MPC: mental processing composite; CBCL: Child Behavior Checklist.

### Abstract

**Objective:** To test effects of gestational age (GA), early social experiences, and child characteristics on children's friendships and perceived peer acceptance.

**Study design:** As part of the prospective Bavarian Longitudinal Study (1147 children, 25-41 weeks GA), children's friendships (e.g., number of friends, frequency of meeting friends) and perceived peer acceptance were assessed before school entry (6 years of age) and in second grade (8 years of age) using child and parent reports. The parent-infant relationship was evaluated during the 5 months after birth. Child characteristics (i.e., height, motor impairment, cognitive ability, behavioral problems) were measured at 6 years of age. Multiple regressions estimated effects of GA, parent-infant relationship, and child characteristics.

**Results:** Overall, children with higher GA had more friends, spent more time with friends, and were more accepted by peers at 6 years of age. Better parent-infant relationships, higher cognitive abilities, and fewer motor and behavioral problems predicted more friendships and higher peer acceptance after adjusting for sex, socioeconomic status, multiples, siblings, and special schooling. Across all GA groups, number of friends (child report: mean change: 1.77, 95% CI [1.57-1.96]) and peer acceptance (child report: 0.14, [0.09-0.19]; parent report: 0.14, [0.11-0.17]) increased with age, but the increase in number of friends was higher among preterm children (i.e., interaction effect age\*GA group:  $p = .034$ ).

**Conclusions:** Our results provide evidence of a dose-response effect of low GA on children's friendships and perceived peer acceptance. Improvements in early parenting and motor, cognitive, and behavioral development may facilitate friendships and peer acceptance for all children across the gestation spectrum.

Children's peer relationships are crucial for their emotional, cognitive, and social development (1). Having close, dyadic friendships and being well-accepted by the peer group facilitates life span mental health, behavioral, and academic outcomes (2-6), and protects against peer victimization (7).

Children born very preterm (VP; < 32 weeks gestational age [GA]) are at increased risk of poor social adjustment (8). Compared with term born peers, VP children more often experience peer relationship problems and social isolation (9-15), and differences persist into adulthood (16, 17). Although social difficulties are well documented for VP / very low birth weight (< 1500 g) individuals, few studies have investigated the social adjustment of moderately to late preterm children (32-36 weeks GA) (18-22). Some have reported more internalizing problems, including social withdrawal (20, 21), whereas others did not (18, 22). There is considerable uncertainty whether VP children's peer relationship problems extend across the whole gestation spectrum (8), as has been found for cognitive difficulties (23). Additionally, past studies mainly investigated the broader domain of peer relationships in VP children using subscales of screening questionnaires, and these were often limited to parent and teacher reports in childhood (9, 14). Little attention has been paid to children's own perceptions of friendships and their quality.

Some studies reported that VP children's social difficulties are related to their cognitive and neuromotor deficits (12, 24), but others found differences after accounting for cognitive or neurosensory impairments (10, 14, 25). Some authors suggest that multiple risk factors such as biological conditions (e.g., brain alterations, poor somatic growth), early life stress (e.g., neonatal pain), social experiences (e.g., parent-infant attachment), and individual child characteristics (e.g., minor motor and visual difficulties, impaired cognitive functions, poor social skills, and early behavioral problems) may contribute to preterm children's vulnerability in social contexts (12, 14, 26, 27). Furthermore, it is uncertain whether entering school provides an opportunity for preterm children to make more friends or whether it may increase the risk of adverse peer relationships (28). Overall, the origins and underlying

mechanisms of preterm children's social relationship problems are still poorly understood (24).

In this study, we investigated children's friendships and perceived peer acceptance across the total spectrum of GA at 6 years of age (before school entry) and at 8 years of age using child and parent reports. First, we expected to find a dose-response effect of GA, that is, children with higher GA would have more friendships and higher perceived peer acceptance, irrespective of whether reported by children or parents. Second, we investigated whether parent-infant relationship as well as child characteristics such as height, motor impairment, cognitive ability, and behavioral problems independently predict number and frequency of meeting friends, and perceived peer acceptance at 6 and 8 years of age. Third, we explored whether friendships and perceived peer acceptance improved or deteriorated from preschool to second grade (6 to 8 years of age).

## Methods

### Participants

Child and parent reports were obtained from the Bavarian Longitudinal Study, a geographically defined population-based sample of neonatal at-risk children who were born in 1985 and 1986 in Southern Bavaria (Germany). There were 7505 children admitted to a children's hospital within the first 10 days after birth (10.6% of all live births) and 916 healthy control children born after 36 weeks GA were recruited (29). Only children whose parents had given written informed consent were included. Details of the sampling criteria, design, and dropout rates have been previously described (30-32). Of the initial sample ( $N = 8421$ ), 1513 children were selected and followed up at 6 and 8 years of age. Children born post-term ( $> 41$  weeks GA;  $n = 41$ ) were excluded because previous findings suggest an elevated risk for adverse developmental outcomes (33). Only participants with complete assessments were included in the current study ( $n = 1147$  [75.8%]; gestation range: 25-41 weeks). Of these, 179 were VP, 231 were healthy full-term (FT) control children born between 39 and 41 weeks of gestation (no neonatal risk), and 737 were born between 32 and 41 weeks GA (randomly selected and stratified according to sex, family socioeconomic status [SES], and

degree of neonatal risk). Participating children born preterm did not suffer from major neurodevelopmental impairments. In case children were born as multiples, all living, same-aged siblings were included in the follow-up assessments and analyses. The study was approved by the Ethics Committee of the University of Munich Children's Hospital and the Bavarian Health Council (Landesärztekammer).

## Measures

**Biological and medical variables at birth.** GA, birth weight, and sex were obtained from obstetric records.

**Parent-infant relationship during the 5 months after birth.** Parent-infant relationships were assessed with a standard parent interview and study nurses' observations. Eight items measuring attachment-related parental feelings and concerns, and relationship problems were evaluated (Table 1; online) and summed into the *Parent-Infant Relationship Index* score ranging from 0 to 8 with greater values indicating poorer parent-infant relationship. Study nurses were trained to ensure the reliability and validity of observations (32).

**Sociodemographic variables at birth, 6, and 8 years of age.** Family SES at birth was coded into three categories based on maternal and paternal highest education and occupation (low, middle, high) (39). Children were grouped by having living multiples (0 = no or dead multiples, 1 = living twin or multiples) at 6 years of age. Additionally, the number of siblings living in the same household at 6 years of age (0 to 7; including multiples) and whether children received special schooling at 8 years of age (0 = no, 1 = yes) was assessed.

**Child characteristics at 6 years of age.** Children's height (in cm) was measured by specially trained research nurses. A German version of the *Test of Motor Impairment - Henderson Revision* (40) was used to assess motor impairment with eight tasks. Children's general cognitive ability (IQ) was assessed with the German version of the *Kaufman - Assessment Battery for Children* mental processing composite score (41, 42). The German

version of the *Child Behavior Checklist* (43) was used to measure children's behavioral problems with 113 items that were summed into one *Total problems* score.

**Children's friendships at 6 and 8 years of age. *Child report.*** The semi-structured *Friendship and Family Interview* (34, 35) was used to assess the nature of children's friendships before children had entered elementary school at 6 years of age (7% had been in school for less than three months) and toward the end of second grade at 8 years of age. Children were asked to name up to ten playmates or friends (siblings not included). These listed friends were summed into a *Number of friends* index score. For the first five of these friends (or fewer, depending on the number listed) children were asked to give information about ages and how often they met their friends (Table 1; online). Responses about ages of friends were counted across friends and grouped to obtain a *Number of older, same age, and younger friends* index score, respectively. The *Frequency of meeting friends* index score was calculated by averaging responses across friends. Interviewers were trained over two months. All interviews were videotaped and double-rated by two psychologists. Interrater-reliability was excellent with a Cohen kappa of  $> 0.95$ .

***Parent report.*** To assess parents' perceptions of their children's friendships at 6 and 8 years of age, the structured *Mannheimer Parent Interview* (36), subsection *Contact with peers*, was administered. Parents were instructed to list up to eight friends including sex, age, and meeting frequencies (Table 1; online). The same index scores as those for the child reports were calculated (i.e., number of friends; number of older, same age, and younger friends; frequency of meeting friends). Interviewers were trained to  $> 95\%$  agreement as described.

**Perceived peer acceptance at 6 and 8 years of age. *Child report.*** An adapted German version of the *Pictorial Scale of Perceived Competence and Social Acceptance for Young Children* (37, 38), subscale *Peer acceptance*, was administered. The scale contains six items that are each presented via two pictures displaying a sex-matched child. Children have to select which of the two children is most like them and responses are coded on a four-point scale with greater values indicating higher acceptance (Table 1; online). The six



items are averaged into a *Perceived peer acceptance* index score. Internal consistency was acceptable ( $\alpha = 0.71$  at 6 years of age,  $\alpha = 0.72$  at 8 years of age).

**Parent report.** Parents answered a parallel version of these items, reformulated into questions (Table 1; online). Internal consistency was  $\alpha = 0.75$  and  $\alpha = 0.79$ , respectively.

### Statistical analysis

Data were analyzed using SPSS 24.0 (IBM SPSS Statistics for Windows, IBM Corp, Armonk, New York). Mean values and frequencies are reported by GA group (VP: < 32 weeks GA; moderately preterm: 32-33 weeks GA; late preterm: 34-36 weeks GA; early term: 37-38 weeks GA; FT [including both neonatal at-risk and healthy children]: 39-41 weeks GA). Interview items were coded zero in case a child had no friends (i.e., 0 = no friend; no older, same age, or younger friend; never meets friends; Table 1; online). The *Frequency of meeting friends* index scores were all z-standardized separately for child and parent reports according to the healthy FT control children in the sample ( $n = 231$ ). This standardization allowed a direct comparison of children's and parents' responses on the different instruments. Analyses were adjusted for children's school entry status at 6 years of age (93% had not yet started school). Missing data in parent-infant relationship scores and child characteristics (0.10% in total) were imputed. The alpha level was set at  $p < .05$  and two-tailed for all analyses. To avoid inflation of type 1 error, multiple comparisons between GA groups were adjusted using the Bonferroni correction.

Multiple regressions were computed to determine the relative impact of GA (25 to 41 weeks), parent-infant relationship neonatally, and child characteristics at 6 years of age on number of friends, frequency of meeting friends, and perceived peer acceptance. All regression models were adjusted for potential confounders (sex, SES, multiples and siblings at 6 years of age, and special schooling at 8 years of age, respectively). To investigate changes from 6 to 8 years of age in friendships and perceived peer acceptance, mixed design two-way ANCOVAs were run with age as within-subjects factor and GA group as between-subjects factor.

## Results

### **Sample description**

Table 2 shows children's descriptive characteristics according to GA groups. VP children were more often male and enrolled in a special school. Family SES, number of siblings, and having living multiples differed between GA groups. Lower GA at birth was associated with poorer parent-infant relationships, smaller stature, lower cognitive ability, greater motor impairments, and higher behavior problem scores at 6 years of age.

### **Children's friendships and perceived peer acceptance at 6 and 8 years of age**

Tables 3 and 4 show children's friendships and perceived peer acceptance according to GA groups separately for child and parent reports. At 6 years of age, children with higher GA had more friends (child and parent reports) and spent more time with friends (child report). Age of friends differed significantly between GA groups, but there was no clear dose-response effect of GA at birth. According to parent reports, perceived peer acceptance was higher for children with higher GA at 6 years of age, but not at 8 years of age. At 8 years of age, children with higher GA had more friends (parent report) and spent more time with friends (child report).

Multiple regression models revealed that the associations diminished after adjusting for child's sex, SES, multiples and siblings at 6 years of age, and special schooling at 8 years of age, but remained significant, except for parent-reported number of friends at 8 years of age (Table 5; online). Overall, correlations between child and parent report were small to medium (Table 6; online).

### **Early social experiences, child characteristics and children's friendships, and perceived peer acceptance**

Multiple regression models showed that early parent-infant relationship and child motor, cognitive, and behavioral development at 6 years of age predicted friendships and perceived peer acceptance (Table 7; online). The pattern of associations differed depending on whether reported by children or parents (Figure 1). Specifically, higher cognitive abilities and fewer motor impairments most consistently predicted child reports of better friendships and higher perceived peer acceptance at 6 and 8 years of age. Across the board, parent

reports of better friendships and higher perceived peer acceptance were explained by a better parent-infant relationship, and fewer behavioral problems and motor impairments.

### **Changes in children's friendships and perceived peer acceptance from preschool to school age**

Number of friends increased from 6 to 8 years of age across all GA groups as reported by children (mean change: 1.77, 95% CI [1.57, 1.96]), but not by parents. This increase in number of friends was higher among preterm children (i.e., interaction effect of age with GA group,  $F[4, 1141] = 2.62, p = .034$ ) compared with FT children (Tables 3 and 4 and Figure 2; online). The frequency of meeting friends did not change from 6 to 8 years of age irrespective of whether reported by children or parents. There were also no differences in changes between GA groups. Perceived peer acceptance increased from 6 to 8 years of age across all GA groups as consistently reported by children (mean change: 0.14, 95% CI [0.09, 0.19]) and parents (mean change: 0.14, 95% CI [0.11, 0.17]). There were no significant differences in changes between GA groups.

### **Discussion**

We investigated the effects of GA across the entire spectrum on children's friendships and perceived peer acceptance at 6 and 8 years of age, and identified early social experiences and child characteristics as main predictors of friendships.

We found that children with higher GA had more friends as consistently reported by children and parents, spent more time with friends, and were more accepted by peers at 6 years of age. This is consistent with findings of previous studies reporting more peer problems and social withdrawal in 5- to 6-year-old VP children (9, 13-15, 25). Additionally, our results extend previous findings on moderately to late preterm children (20, 21) indicating that friendship and peer problems are also more prevalent after moderately to late preterm birth. In contrast, at 8 years of age, the effects of GA on number of friends and perceived peer acceptance diminished, which is in line with previous findings on preterm adolescents (46, 47), and suggests that with the transition into elementary school most preterm children may partly catch up with their FT peers. Nevertheless, particularly VP children still

experience disadvantages, including fewer time spent with their friends. Overall, preterm children themselves felt accepted by their peer group despite having fewer friends and spending less time with them than FT peers. There is recent evidence that number of friends is related to poor health-related quality of life in VP adults (48). Unknown is whether the perception of being accepted in childhood may positively affect later quality of life. This requires further prospective research. Previous findings on preterm children's peer relationships in early elementary school are somewhat conflicting. Some studies found persisting peer problems in 7- to 8-year-old extremely preterm children (< 28 weeks GA) (10, 12), even after adjusting for potential confounders, although other studies on VP children did not (11). In line with previous findings (46), our results provide evidence that not all areas of peer functioning may be equally affected and that degree of prematurity and age may be critical. Extremely preterm children in particular may be likely to experience peer problems (8), but were underrepresented in this sample ( $n = 19$ ).

It is important to identify those children who are at greatest risk of peer relationship difficulties given the adverse impacts on later adjustment (5, 49). We identified child characteristics as well as quality of parent-infant relationship as independent predictors of children's friendships and perceived peer acceptance. In particular, we found that better motor and cognitive abilities predicted having more friends and spending more time with friends according to child reports, whereas parents reported better friendship relationships if children had fewer motor impairments and additionally fewer behavioral problems. Thus, parents' judgments were based more on observable functioning. Accordingly, it has been shown that children with motor or cognitive impairments experience more peer problems and have limited access to peer activities, which may challenge their future social development (50-52). Children with motor difficulties are more likely to avoid social situations and physical activities owing to anxiety, which may prevent them from making contact with peers and forming friendships (51). Moreover, lower cognitive ability has been associated with difficulties in developing social skills (27, 53). Finally, better parent-infant relationships also predicted having more friends at 8 years of age and being more accepted at 6 years of age,

according to parent reports. Thus, in addition to functional deficits, our findings support the importance of parent-infant relationship quality for children's peer relationships consistent with previous findings (54). It is commonly suggested that relationship patterns and social skills experienced in the family environment are likely transferred to the peer context (55).

Risk factors for poor peer acceptance were characteristics that are observable by peers such as motor impairments, behavior problems, and tall stature. Indeed, certain social problem behaviors are considered as potential risk factors for peer relationship difficulties when displayed in interpersonal contexts (56). Aggressive, disruptive, anxious, or withdrawal behavior in social interactions may be perceived as inappropriate or signal vulnerability to peers and is, therefore, disliked or rejected (5, 49, 57, 58). Thus, our findings indicate that preterm children's more frequent functional limitations in cognitive, behavioral, and motor abilities (20, 21, 59-62) may at least in part explain their difficulties with peers. Moreover, tall stature may also be a risk factor of being less accepted by peers in elementary school age, independent of GA. Stronger boys have been reported more likely to bully others (63), although it does not seem to be related to more victimization (24).

Having living multiples at 6 years of age consistently predicted poorer friendships and peer acceptance at 6 and 8 years of age. In contrast, effects of number of siblings were less consistent. Twins and higher-order multiples may have an exclusive, close relationship, spending a considerable amount of time together (64), which may decrease the necessity of social contacts with other same-aged peers. In contrast, relationships with singleton siblings may be less intimate (65), which may also affect peer relationships (66). We re-analyzed our regression models separately for children having living multiples vs. being singleton at 6 years of age; however, results did not significantly change and were stable across the two groups.

In line with previous findings (67, 68), our results reveal that friendship networks and acceptance by peers increase with the transition into school. Most children have a best mutual friend in school, typically make new friends, and also keep some of their preschool friends (69). Attending school offers expanding opportunities of social contacts in the

classroom and by memberships in extracurricular activities that are not arranged by close caregivers (70). However, the increase in number of friends was higher among preterm children compared with FT children. Before 6 years of age, almost all children in our sample (97%), irrespective of GA, attended child care outside their homes with contact with peers. Nevertheless, preterm children's parents may constrain their vulnerable children's contact with peers before formal school entry, which has been found to affect the number of playmates (6). In contrast, preterm children equally participate in leisure activities at early school age (71), which may facilitate contact with peers and forming friendships.

This study has several strengths. We gathered data from a prospective, large, whole-population sample that was followed longitudinally at 6 and 8 years of age. We investigated friendships and peer acceptance across the full range of GA, and adjusted main analyses for a range of potential confounders. Comparability of friendship and peer outcomes over time was provided by using the same instruments at 6 and 8 years of age. We assessed children's self-perceptions in addition to parent reports. Comparable with previous studies on quality of life in preterm individuals (48), we found discrepancies in child- and parent-perceived friendships and acceptance by peers. Children seem to have a more positive view of their social adjustment. In contrast, parents may perceive greater vulnerability in their child leading to overestimations of problems (72). However, previous studies showed that parents' judgments were better explained by objective measures of children's earlier functioning than child reports indicating a more realistic perspective of parents (73).

This study also has limitations. First, because the study sample was recruited between 1985 and 1986, more contemporary replications of our findings are required. Moreover, the growing use of new communication technologies and social networking sites, which offer additional opportunities to connect with peers, should be addressed in future studies. Second, participants and children who dropped out at follow-up assessments at 6 years of age differed in biological and child characteristics, which may have led to an underestimation of true difficulties in friendships. Third, this study relied on subjective, unilateral choices of friends and (self-) perceptions of peer acceptance. Other approaches

are the use of sociometric methods in which only reciprocated friendship preferences and likings are considered (67). However, sociometric methods are restricted to peer ratings and nominations in the classroom, and neglect friendships outside of school (6). In this epidemiological study in South Bavaria, children were not in school at 6 years of age and went to hundreds of different schools at 8 years of age, which made sociometric assessments impossible. Moreover, some studies have emphasized the predictive value of children's self-perceived peer functioning for later adjustment rather than actual peer functioning (74). Finally, about 7% of participating children had already started school at 6 years of age because the scheduling and re-scheduling of assessments led to an average assessment age of 6 years 3 months. Therefore, we adjusted regression and longitudinal analyses for school entry status.

Our results add to emerging evidence of a dose-response effect of low GA on children's friendships and peer acceptance. It is recommended that preterm children should regularly be followed by health professionals to identify problems in peer-related competence and behavior early (75). Although most preterm children catch up with their FT peers during early elementary school, future interventions to improve friendships and social interaction skills should start before school entry to prevent later psychopathology and behavior problems (5). However, preterm children's early social experiences as well as their frequent deficits in cognition, behavior, and motor skills may better explain their friendship and peer problems than GA per se. Thus, improving early parenting and motor, cognitive, and behavioral development may also facilitate friendships and peer acceptance for children across the whole gestation spectrum. Multimodal training methods may be particularly effective when involving parents, teachers, and classroom settings (76-78).

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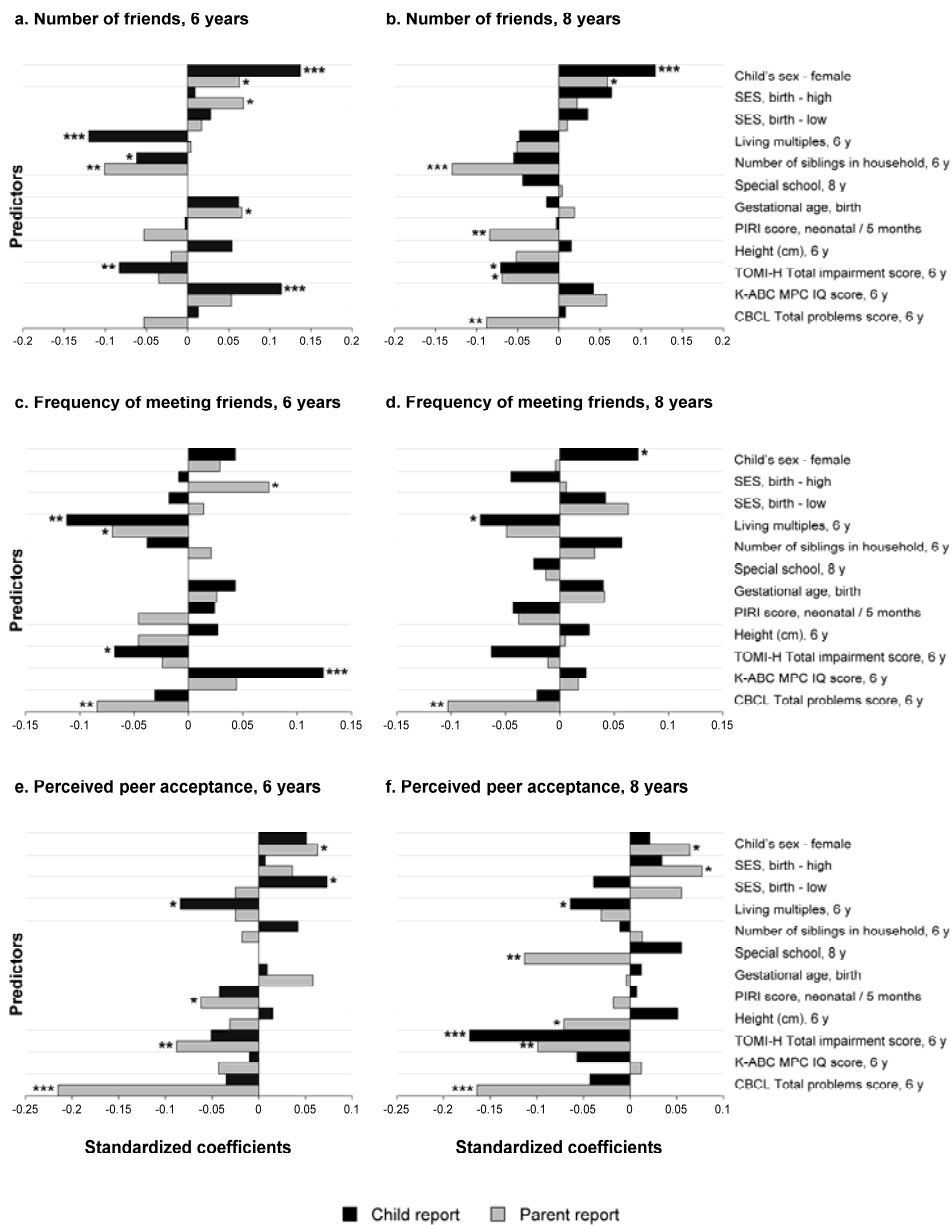
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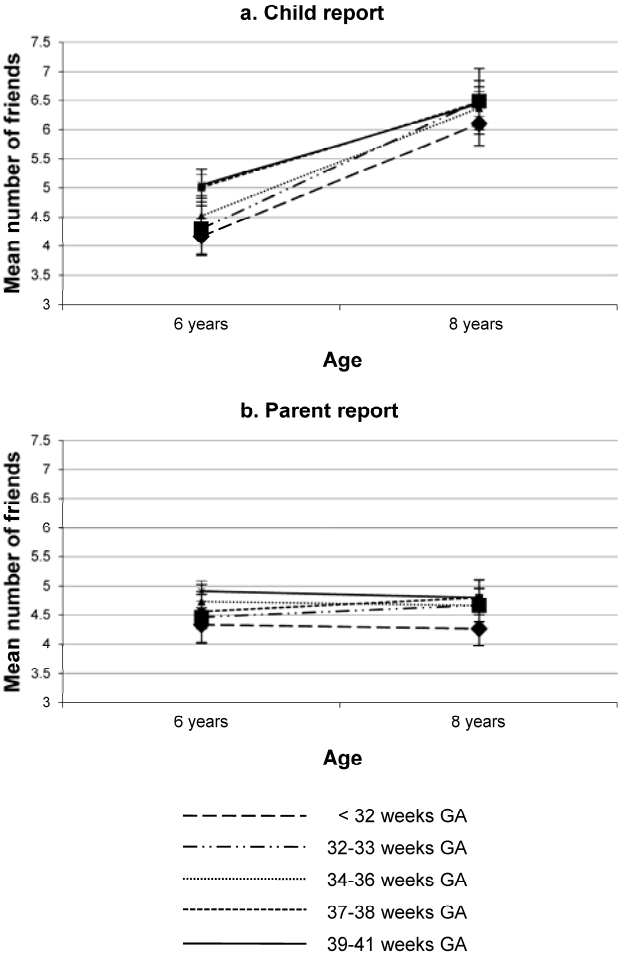
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**Figure 1.** Standardized regression coefficients for child- and parent-reported number of friends, frequency of meeting friends, and perceived peer acceptance at 6 and 8 years of age predicted by potential confounders, GA, parent-infant relationship, and child characteristics. PIRI: Parent-Infant Relationship Index; TOMI-H: Test of Motor Impairment - Henderson Revision; K-ABC: Kaufman - Assessment Battery for Children; MPC: mental processing composite; CBCL: Child Behavior Checklist. Multiple regression models were adjusted for children’s school entry status at 6 years of age.  $N = 1147$ . \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .



**Figure 2.** Mean number of friends reported by children (a.) and parents (b.) at 6 and 8 years of age according to different GA groups. Error bars represent 95% CIs. *F*-tests were adjusted for children’s school entry status at 6 years of age. *N* = 1147.



**Table 1.** Overview of assessment, time of measurement, definition, score / categories, and interview questions / items of parent-infant relationship, children’s friendships, and perceived peer acceptance.

Variable	Assessment and time of measurement	Definition	Score / categories	Interview questions* / items
<i>Parent-Infant Relationship Index</i> score (PIRI) (32)	Standard interview with parents and observations of study nurses; seven neonatal items and one item at 5 months of age.	Eight items evaluating attachment-related parental feelings and concerns, and current or anticipated relationship problems are answered on three- to five-point scales and dichotomized (0 = no concern or problem, 1 = problem as defined by item).	Responses are summed up into an index score, ranging from 0 (good parent-infant relationship) to 8 (poor parent-infant relationship).	Item 1) “Mother has not yet established a relationship to the infant.” (mother, neonatal) Item 2) “Mother visits the infant one time per week / less on the neonatal ward.” (mother, neonatal) Item 3) “Father visits the infant one time per week / not at all on the neonatal ward.” (mother or father, neonatal) Item 4) “Mother feels very insecure with the infant’s care at home.” (mother, neonatal) Item 5) “Mother shows (very) little pleasure when interacting with the infant.” (study nurse, neonatal) Item 6) “Father shows (very) little pleasure when interacting with the infant.” (study nurse, neonatal) Item 7) “The probability of subsequent parent-infant care problems is rated high.” (study nurse, neonatal) Item 8) “Mother had difficulties in establishing a relationship to the infant.” (mother, at 5 months of age)
Children’s friendships reported by children	Semi-structured <i>Friendship and Family Interview</i> (34, 35) with the	Questions assess the nature of children’s friendships.		

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	child at 6 and 8 years of age.		
<i>Number of friends index score</i>	Children are asked to name up to ten playmates or friends (siblings not included). The item was coded one (i.e., friend). In case a child had no friends, the item was coded zero (i.e., no friend).	Responses are summed up across ten friends into a <i>Number of friends</i> index score, ranging from 0 to 10.	“Who do you like to play with? – What are the names of the children, who you like to play with? – Anyone else?” (at 6 years of age) “Who do you like to play with? – What are the names of your friends or playmates? – Anyone else?” (at 8 years of age)
<i>Number of older, same age, or younger friends index score</i>	Children are asked to give information about ages for the first five friends (or fewer depending on the number listed). In case a child had no friends, the item was coded zero (i.e., no younger, same age, or older friend).	Friends were grouped by age into younger, older, or same age friends, respectively. Dichotomous responses (0 = no, 1 = yes) are counted across five friends to obtain an index score for each category, ranging from 0 to 5.	“Do you know how old NAME OF FRIEND is? Is NAME OF FRIEND older or younger than you?” (at 6 years of age) “Do you know how old NAME OF FRIEND is? Is NAME OF FRIEND older or younger than you?” (at 8 years of age)
<i>Frequency of meeting friends index score</i>	Children are asked how often they met these first five friends (or fewer depending on the number listed) using a five-point scale (1 = rarely, 2 = one to three times a month, 3 = once a week, 4 = more often during the week, 5 = daily (working days)). In case a child had no friends, the item was coded zero (i.e., 0 = never). Only real, durable social interactions (i.e., playing / doing something	Responses are averaged across five friends into a <i>Frequency of meeting friends</i> index score, ranging from 0 to 5. Then, the scores were z-standardized separately for child and parent reports according to the healthy FT control children in the sample ( $n = 231$ ) to be able to compare	“How often do you see / meet NAME OF FRIEND?” (at 6 years of age) “How often do you meet NAME OF FRIEND to play with?” (at 8 years of age)

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		together, but not just talking to each other in school) were considered.	children's and parents' responses because interval scaled response category options were different for child and parent reports.	
Children's friendships reported by parents	Structured <i>Mannheimer Parent Interview</i> (36), subsection <i>Contact with peers</i> , with the parent at 6 and 8 years of age.	Questions assess parents' perceptions of their child's contact with peers.		
<i>Number of friends</i> index score		Parents are asked to list up to eight friends (siblings not included). The item was coded one (i.e., friend). In case a child had no friends, the item was coded zero (i.e., no friend).	Responses are summed up across eight friends into a <i>Number of friends</i> index score, ranging from 0 to 8.	"Does your child have friends? – Could you please list me the friends, their first names, sex, and ages?" (at 6 years of age) "Does your child have friends? – Could you please list me the friends, their first names, sex, ages, and whether he / she is in same grade?" (at 8 years of age)
<i>Number of older, same age, or younger friends</i> index score		Parents are asked to give information about ages for the eight friends (or fewer depending on the number listed). In case a child had no friends, the item was coded zero (i.e., no younger, same age, or older friend).	Friends were grouped by age into younger, older, or same age friends, respectively. Dichotomous responses (0 = no, 1 = yes) are counted across eight friends to obtain an index score for each category, ranging from 0 to 8.	"Does your child have friends? – Could you please list me the friends, their first names, sex, and ages?" (at 6 years of age; see above) "Does your child have friends? – Could you please list me the friends, their first names, sex, ages, and whether he / she is in same grade?" (at 8 years of age; see above)
<i>Frequency of meeting friends</i> index score		Parents are asked how often their child met his / her friends using a six-point scale (1 = rarely (one to three	Responses of the <i>Frequency of meeting friends</i> index score, ranging	"How often does your child meet his / her friends?" (multiple or at least one of the listed friends, during the whole last year) (at 6 years of age)

days a month), 2 = one to two days a week, 3 = three to four days a week, 4 = five to six days a week, 5 = daily, 6 = several times daily). In case a child had no friends, the item was coded zero (i.e., 0 = never).

from 0 to 6, were z-standardized separately for child and parent reports according to the healthy FT control children in the sample ( $n = 231$ ) to be able to compare children's and parents' responses because interval scaled response category options were different for child and parent reports.

"How often does your child meet his / her friends?" (multiple or at least one of the listed friends, during the whole last year) (at 8 years of age)

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<i>Perceived peer acceptance index score</i>	Adapted German version of the <i>Pictorial Scale of Perceived Competence and Social Acceptance for Young Children</i> (37, 38), subscale <i>Peer acceptance</i> , with the child and parent at 6 and 8 years of age.			
Child report		The scale contains six items that are each presented via two pictures displaying a sex-matched child doing a particular activity (e.g., doing a jigsaw puzzle). Two statements relating to the pictures are read to the children (e.g., "the child on the left is good at puzzles, but the child	Responses of the six items are averaged into a <i>Perceived peer acceptance index score</i> , ranging from 1 to 4.	Item 1) "Has friends to play with." Item 2) "Stays overnight at his / her friends' houses." Item 3) "Has friends to play games with." Item 4) "Has friends on the playground." Item 5) "Other children ask if child wants to play." Item 6) "Eats at his / her friends' houses."

on the right is not very good at puzzles.”). Children have to select which of the two children is most like them and then indicate if the selected child is a lot or just a little bit like them. Responses are coded on a four-point scale with greater values indicating higher acceptance.

Parent report

The same six items as in the child version, reformulated into questions (parallel version of the described items), are answered by parents. Responses are coded on a four-point scale with greater values indicating higher acceptance.

Responses of the six items are averaged into a *Perceived peer acceptance* index score, ranging from 1 to 4.

- Item 1) “How many friends does your child have to play with?”
- Item 2) “How often does your child stay overnight at his / her friends’ houses?”
- Item 3) “How many friends does your child have to play games with?”
- Item 4) “How many friends does your child have to play with on the playground?”
- Item 5) “How often do other children ask if your child wants to play?”
- Item 6) “How often does your child eat at his / her friends’ houses?”

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\*Interviewer starts with standard questions, but may ask additional questions to avoid misinterpretations and ensure full understanding. Number of best friends, number of friends in same grade, liking of friends, playing venues, and staying overs were also assessed, but not reported here.

**Table 2.** Biological, medical, and social variables, and child characteristics of the study sample ( $N = 1147$ ) according to GA groups.

	< 32 wk GA <i>n</i> = 179	32-33 wk GA <i>n</i> = 79	34-36 wk GA <i>n</i> = 183	37-38 wk GA <i>n</i> = 173	39-41 wk GA <i>n</i> = 533	<i>F</i> / $\chi^2$	<i>p</i> <sup>†</sup>
Child's sex, male	109 (61%)	36 (46%)	93 (51%)	82 (47%)	260 (49%)	9.81	.044
GA, wk	29.61 (1.47)	32.51 (0.50)	35.12 (0.76)	37.54 (0.50)	39.94 (0.69)	5334.78 <sup>‡</sup>	< .001
Birth weight, g	1311 (335)	1689 (374)	2219 (536)	2811 (528)	3391 (498)	1096.77 <sup>‡</sup>	< .001
Family SES, birth						16.39	.037
High	43 (24%)	22 (28%)	73 (40%)	63 (36%)	174 (33%)		
Middle	73 (41%)	30 (38%)	50 (27%)	57 (33%)	203 (38%)		
Low	63 (35%)	27 (34%)	60 (33%)	53 (31%)	156 (29%)		
PIRI Parent-infant relationship, birth / 5 months <sup>††</sup>	0.80 (1.02)	0.58 (0.85)	0.49 (0.76)	0.51 (0.83)	0.42 (0.73)	5.61 <sup>‡</sup>	< .001
Living multiples, 6 y	42 (23%)	12 (15%)	19 (10%)	11 (6%)	4 (1%)	107.69	< .001
Number of siblings living in household, 6 y	1.31 (1.10)	1.13 (1.05)	0.96 (0.76)	1.16 (0.89)	1.06 (0.76)	3.67 <sup>‡</sup>	.006
Height (cm), 6 y	116.23 (5.34)	116.77 (5.57)	117.64 (4.74)	118.67 (5.00)	118.56 (4.84)	9.46	< .001
TOMI-H Total impairment score, 6 y	3.04 (3.09)	2.44 (2.86)	1.64 (1.93)	1.60 (1.79)	1.48 (1.85)	11.67 <sup>‡</sup>	< .001
K-ABC MPC IQ score, 6 y	90.57 (12.21)	94.40 (11.59)	97.35 (11.17)	99.25 (10.07)	99.44 (11.02)	23.91	< .001
CBCL Total problems score, 6 y	31.34 (17.26)	25.63 (12.45)	25.84 (12.75)	27.24 (14.51)	26.13 (14.13)	3.83 <sup>‡</sup>	.005
Special school, 8 y	19 (11%)	2 (3%)	2 (1%)	2 (1%)	8 (2%)	31.41 <sup>§</sup>	< .001

Data are presented as mean (*SD*) for continuous variables and numbers (%) for categorical variables. PIRI: Parent-Infant Relationship Index;

TOMI-H: Test of Motor Impairment - Henderson Revision; K-ABC: Kaufman - Assessment Battery for Children; MPC: mental processing

composite; CBCL: Child Behavior Checklist. <sup>†</sup> Two-tailed significance based on one-way ANOVAs or  $\chi^2$ -tests. <sup>‡</sup> Adjusted *F*-tests reporting Welch's

*F* in case of violated assumption of homogeneity of variance. <sup>§</sup> Reporting *Fisher's Exact Test*. <sup>††</sup> Higher PIRI scores indicate poorer parent-infant relationship.



**Table 3.** Child self-report of friendships and perceived peer acceptance according to GA groups at 6 and 8 years of age ( $N = 1147$ ).

Outcomes	< 32 wk GA $n = 179$	32-33 wk GA $n = 79$	34-36 wk GA $n = 183$	37-38 wk GA $n = 173$	39-41 wk GA $n = 533$	$F$	$p^\dagger$
<b>Assessments at 6 years</b>							
Number of friends	4.16 (2.12)***	4.38 (2.02)*	4.54 (2.18)*	4.98 (1.99)	5.04 (2.09)	7.61	< .001
Frequency of meeting friends <sup>§</sup>	-0.37 (1.13)***	-0.21 (1.08)	-0.22 (1.06)	-0.12 (0.87)	-0.03 (0.94)	3.89 <sup>‡</sup>	.004
Number of older friends	0.87 (1.12)	0.77 (0.97)*	0.98 (1.23)	1.23 (1.28)	1.10 (1.24)	3.78 <sup>‡</sup>	.005
Number of same age friends	1.49 (1.32)	1.75 (1.27)	1.50 (1.24)	1.57 (1.32)	1.74 (1.30)	2.20	.067
Number of younger friends	1.30 (1.18)	1.27 (1.06)	1.37 (1.24)	1.40 (1.22)	1.34 (1.22)	0.28	.892
Perceived peer acceptance	2.62 (0.66)	2.62 (0.62)	2.73 (0.57)	2.69 (0.60)	2.71 (0.57)	1.30	.268
<b>Assessments at 8 years</b>							
Number of friends	6.10 (2.76)	6.51 (2.42)	6.37 (2.58)	6.46 (2.46)	6.44 (2.48)	0.71	.586
Frequency of meeting friends <sup>§</sup>	-0.33 (1.12)**	-0.12 (0.97)	-0.12 (1.04)	-0.03 (0.97)	-0.05 (1.00)	2.86	.022
Number of older friends	0.90 (1.16)	0.92 (1.23)	0.88 (1.16)	1.04 (1.13)	1.00 (1.18)	0.68	.603
Number of same age friends	2.02 (1.65)***	2.30 (1.64)	2.54 (1.50)	2.44 (1.60)	2.58 (1.53)	4.56	.001
Number of younger friends	1.41 (1.47)**	1.42 (1.41)*	1.11 (1.27)	1.11 (1.30)	0.98 (1.23)	4.18 <sup>‡</sup>	.003
Perceived peer acceptance	2.74 (0.61)	2.77 (0.54)	2.86 (0.53)	2.81 (0.58)	2.86 (0.58)	1.78	.131

Data are presented as mean (SD). \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ ; planned contrasts testing all GA groups against FT children as reference group, adjusted for multiple testing using Bonferroni correction. <sup>†</sup> Two-tailed significance based on one-way ANOVAs. <sup>‡</sup> Adjusted  $F$ -tests reporting Welch's  $F$  in case of violated assumption of homogeneity of variance. <sup>§</sup> The *Frequency of meeting friends* variables were all z-standardized according to healthy FT control children ( $n = 231$ ) because interval scaled response category options were different for child and parent reports (see *Methods*).

**Table 4.** Parent report of children’s friendships and perceived peer acceptance according to GA groups at 6 and 8 years of age ( $N = 1147$ ).

Outcomes	< 32 wk GA <i>n</i> = 179	32-33 wk GA <i>n</i> = 79	34-36 wk GA <i>n</i> = 183	37-38 wk GA <i>n</i> = 173	39-41 wk GA <i>n</i> = 533	<i>F</i>	<i>p</i> <sup>†</sup>
<b>Assessments at 6 years</b>							
Number of friends	4.32 (2.11)**	4.49 (2.14)	4.74 (1.97)	4.55 (2.10)	4.91 (1.96)	3.44	.008
Frequency of meeting friends <sup>§</sup>	-0.26 (1.07)	-0.21 (1.03)	-0.05 (0.92)	-0.18 (1.20)	-0.04 (0.96)	2.29	.058
Number of older friends	1.21 (1.52)	1.18 (1.37)	1.40 (1.58)	1.35 (1.55)	1.49 (1.54)	1.63	.165
Number of same age friends	1.89 (1.58)**	2.20 (1.69)	2.09 (1.66)	1.97 (1.47)	2.31 (1.62)	3.20	.013
Number of younger friends	1.22 (1.27)	1.11 (1.34)	1.24 (1.29)	1.24 (1.37)	1.11 (1.20)	0.74	.568
Perceived peer acceptance	2.23 (0.46)***	2.29 (0.43)	2.35 (0.42)	2.38 (0.46)	2.37 (0.45)	3.69	.005
<b>Assessments at 8 years</b>							
Number of friends	4.26 (2.19)**	4.66 (1.91)	4.66 (1.93)	4.80 (1.95)	4.80 (1.96)	2.72	.029
Frequency of meeting friends <sup>§</sup>	-0.25 (1.13)	0.08 (1.10)	-0.08 (0.98)	-0.03 (1.01)	0.00 (1.01)	2.17 <sup>‡</sup>	.072
Number of older friends	0.95 (1.18)	1.08 (1.33)	0.97 (1.19)	1.08 (1.29)	1.10 (1.33)	0.64	.635
Number of same age friends	2.17 (1.80)***	2.58 (1.89)	2.68 (1.68)	2.83 (1.85)	2.85 (1.77)	5.18	< .001
Number of younger friends	1.13 (1.53)	1.00 (1.30)	1.01 (1.30)	0.90 (1.24)	0.86 (1.20)	1.49 <sup>‡</sup>	.206
Perceived peer acceptance	2.38 (0.47)	2.47 (0.51)	2.49 (0.44)	2.49 (0.43)	2.48 (0.44)	1.95	.100

Data are presented as mean (*SD*). \*\*\*  $p < .001$ , \*\*  $p < .01$ ; planned contrasts testing all GA groups against FT children as reference group, adjusted for multiple testing using Bonferroni correction. † Two-tailed significance based on one-way ANOVAs. ‡ Adjusted *F*-tests reporting Welch’s *F* in case of violated assumption of homogeneity of variance. § The *Frequency of meeting friends* variables were all z-standardized according to healthy FT control children ( $n = 231$ ) because interval scaled response category options were different for child and parent reports (see *Methods*).

**Table 5.** Standardized regression coefficients (95% CIs) and model fit for child- and parent-reported number of friends, frequency of meeting friends, and perceived peer acceptance at 6 and 8 years of age predicted by potential confounders and GA ( $N = 1147$ ).

Variables	Child report		Parent report	
	6 years	8 years	6 years	8 years
<b>Number of friends</b>				
Child's sex - female	0.133*** (0.076, 0.189)	0.117*** (0.060, 0.175)	0.072* (0.014, 0.129)	0.076* (0.018, 0.133)
SES, birth - high	0.030 (-0.033, 0.093)	0.074* (0.009, 0.139)	0.076* (0.011, 0.141)	0.030 (-0.033, 0.093)
SES, birth - low	0.016 (-0.048, 0.080)	0.030 (-0.035, 0.095)	0.005 (-0.060, 0.070)	-0.007 (-0.074, 0.060)
Living multiples, 6 y	-0.115*** (-0.169, -0.061)	-0.045 (-0.109, 0.018)	0.009 (-0.055, 0.072)	-0.046 (-0.116, 0.025)
Number of siblings, 6 y	-0.074* (-0.133, -0.015)	-0.058 (-0.120, 0.003)	-0.106** (-0.167, -0.046)	-0.131*** (-0.186, -0.075)
Special school, 8 y <sup>†</sup>		-0.073* (-0.132, -0.015)		-0.041 (-0.108, 0.025)
GA, birth	0.124*** (0.064, 0.184)	0.012 (-0.049, 0.073)	0.100** (0.040, 0.160)	0.059 (-0.005, 0.123)
$R^2$ , adjusted $R^2$	.077***, .071	.035***, .028	.036***, .031	.042***, .035
<b>Frequency of meeting friends</b>				
Child's sex - female	0.046 (-0.012, 0.103)	0.074* (0.016, 0.131)	0.044 (-0.014, 0.102)	0.007 (-0.052, 0.065)
SES, birth - high	0.008 (-0.055, 0.071)	-0.037 (-0.102, 0.028)	0.077* (0.012, 0.143)	0.006 (-0.059, 0.072)
SES, birth - low	-0.034 (-0.101, 0.032)	0.038 (-0.027, 0.103)	0.000 (-0.065, 0.066)	0.054 (-0.011, 0.120)
Living multiples, 6 y	-0.105** (-0.177, -0.034)	-0.069* (-0.133, -0.005)	-0.065* (-0.128, -0.001)	-0.045 (-0.109, 0.019)
Number of siblings, 6 y	-0.045 (-0.108, 0.019)	0.052 (-0.010, 0.113)	0.020 (-0.041, 0.081)	0.034 (-0.028, 0.096)
Special school, 8 y <sup>†</sup>		-0.053 (-0.112, 0.006)		-0.035 (-0.094, 0.024)
GA, birth	0.100** (0.034, 0.166)	0.072* (0.011, 0.134)	0.053 (-0.007, 0.114)	0.064* (0.002, 0.125)
$R^2$ , adjusted $R^2$	.041***, .035	.026***, .019	.017**, .011	.012, .005
<b>Perceived peer acceptance</b>				

Child's sex - female	0.055 (-0.003, 0.113)	0.027 (-0.031, 0.086)	0.094** (0.036, 0.151)	0.092** (0.035, 0.149)
SES, birth - high	0.011 (-0.055, 0.077)	0.040 (-0.024, 0.103)	0.033 (-0.029, 0.096)	0.076* (0.012, 0.140)
SES, birth - low	0.072* (0.006, 0.138)	-0.034 (-0.103, 0.035)	-0.035 (-0.102, 0.033)	0.039 (-0.026, 0.103)
Living multiples, 6 y	-0.080* (-0.153, -0.006)	-0.055 (-0.119, 0.009)	-0.012 (-0.076, 0.053)	-0.020 (-0.085, 0.044)
Number of siblings, 6 y	0.036 (-0.029, 0.101)	-0.016 (-0.083, 0.051)	-0.020 (-0.081, 0.042)	0.020 (-0.042, 0.082)
Special school, 8 y <sup>‡</sup>		0.008 (-0.069, 0.085)		-0.163*** (-0.239, -0.088)
GA, birth	0.034 (-0.034, 0.101)	0.047 (-0.018, 0.112)	0.100** (0.037, 0.163)	0.025 (-0.037, 0.087)
$R^2$ , adjusted $R^2$	.017**, .011	.013, .006	.026***, .020	.044***, .038

Statistical significance of standardized regression coefficients  $\beta$  based on Student's  $t$ -tests, statistical significance of explained variance  $R^2$  based on  $F$ -tests. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ . Multiple regression models were adjusted in case of heteroscedasticity using heteroscedasticity-consistent standard error estimators (44, 45). Models were adjusted for children's school entry status at 6 years of age. <sup>‡</sup> The variable *Special school, 8 y* was included as a predictor in regression models at 8-year assessments.

**Table 6.** Correlations between child self-report and parent report of children's friendships and perceived peer acceptance at 6 and 8 years of age according to GA groups ( $N = 1147$ ).

Outcomes	< 32 wk GA $n = 179$	32-33 wk GA $n = 79$	34-36 wk GA $n = 183$	37-38 wk GA $n = 173$	39-41 wk GA $n = 533$
<b>Assessments at 6 years</b>					
Number of friends	.427***	.422**	.269**	.306**	.288***
Frequency of meeting friends <sup>§</sup>	.280**	.382*	.283**	.255*	.198***
Perceived peer acceptance	.217	.157	.252*	.285**	.289***
<b>Assessments at 8 years</b>					
Number of friends	.277**	.419**	.319***	.288**	.265***
Frequency of meeting friends <sup>§</sup>	.234*	.092	.145	.139	.251***
Perceived peer acceptance	.195	.592***	.352***	.289**	.259***

Agreement between child self-report and parent report was estimated using Pearson correlation coefficients. Significance tests were all two-tailed and adjusted for multiple testing using Bonferroni correction. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ . § The *Frequency of meeting friends* variables were all z-standardized according to healthy FT control children ( $n = 231$ ) because interval scaled response category options were different for child and parent reports (see *Methods*).

**Table 7.** Standardized regression coefficients (95% CIs) and model fit for child- and parent-reported number of friends, frequency of meeting friends, and perceived peer acceptance at 6 and 8 years of age predicted by potential confounders, GA, parent-infant relationship, and child characteristics ( $N = 1147$ ).

Variables	Child report		Parent report	
	6 years	8 years	6 years	8 years
<b>Number of friends</b>				
Child's sex - female	0.137*** (0.081, 0.193)	0.117*** (0.059, 0.175)	0.063* (0.005, 0.121)	0.059* (0.002, 0.116)
SES, birth - high	0.009 (-0.054, 0.072)	0.064 (-0.001, 0.130)	0.068* (0.003, 0.133)	0.022 (-0.042, 0.086)
SES, birth - low	0.028 (-0.035, 0.091)	0.035 (-0.031, 0.100)	0.017 (-0.048, 0.082)	0.010 (-0.055, 0.074)
Living multiples, 6 y	-0.120*** (-0.181, -0.059)	-0.048 (-0.111, 0.016)	0.004 (-0.059, 0.067)	-0.051 (-0.114, 0.011)
Number of siblings, 6 y	-0.062* (-0.122, -0.003)	-0.055 (-0.117, 0.006)	-0.101** (-0.162, -0.040)	-0.130*** (-0.190, -0.069)
Special school, 8 y <sup>†</sup>		-0.044 (-0.106, 0.018)		0.004 (-0.058, 0.065)
GA, birth	0.062 (0.000, 0.125)	-0.015 (-0.080, 0.049)	0.066* (0.001, 0.130)	0.019 (-0.045, 0.083)
PIRI score, neonatal / 5 months	-0.003 (-0.060, 0.054)	-0.003 (-0.062, 0.056)	-0.053 (-0.112, 0.006)	-0.084** (-0.142, -0.026)
Height (cm), 6 y	0.054 (-0.003, 0.112)	0.015 (-0.045, 0.074)	-0.020 (-0.080, 0.039)	-0.052 (-0.111, 0.006)
TOMI-H Total impairment score, 6 y	-0.083** (-0.143, -0.022)	-0.071* (-0.136, -0.007)	-0.035 (-0.097, 0.027)	-0.069* (-0.133, -0.005)
K-ABC MPC IQ score, 6 y	0.114*** (0.053, 0.176)	0.042 (-0.022, 0.107)	0.053 (-0.010, 0.117)	0.058 (-0.005, 0.122)
CBCL Total problems score, 6 y	0.013 (-0.043, 0.070)	0.008 (-0.051, 0.067)	-0.053 (-0.112, 0.005)	-0.088** (-0.146, -0.030)
$R^2$ , adjusted $R^2$	.102***, .092	.042***, .031	.049***, .039	.070***, .059
<b>Frequency of meeting friends</b>				
Child's sex - female	0.043 (-0.014, 0.100)	0.072* (0.013, 0.130)	0.029 (-0.029, 0.088)	-0.004 (-0.063, 0.055)
SES, birth - high	-0.009 (-0.072, 0.054)	-0.045 (-0.111, 0.020)	0.074* (0.008, 0.139)	0.006 (-0.059, 0.072)
SES, birth - low	-0.018 (-0.084, 0.049)	0.042 (-0.024, 0.108)	0.014 (-0.052, 0.080)	0.063 (-0.005, 0.131)

Living multiples, 6 y	-0.112** (-0.183, -0.040)	-0.073* (-0.136, -0.009)	-0.070* (-0.133, -0.006)	-0.049 (-0.118, 0.020)
Number of siblings, 6 y	-0.038 (-0.101, 0.025)	0.057 (-0.005, 0.119)	0.021 (-0.040, 0.083)	0.032 (-0.029, 0.094)
Special school, 8 y <sup>‡</sup>		-0.024 (-0.086, 0.039)		-0.013 (-0.088, 0.062)
GA, birth	0.043 (-0.024, 0.110)	0.040 (-0.025, 0.105)	0.026 (-0.039, 0.092)	0.041 (-0.025, 0.106)
PIRI score, neonatal / 5 months	0.024 (-0.042, 0.090)	-0.043 (-0.103, 0.016)	-0.046 (-0.105, 0.013)	-0.038 (-0.104, 0.028)
Height (cm), 6 y	0.027 (-0.032, 0.085)	0.027 (-0.033, 0.087)	-0.046 (-0.106, 0.013)	0.005 (-0.057, 0.068)
TOMI-H Total impairment score, 6 y	-0.068* (-0.135, -0.001)	-0.063 (-0.128, 0.001)	-0.024 (-0.087, 0.039)	-0.011 (-0.083, 0.061)
K-ABC MPC IQ score, 6 y	0.124*** (0.063, 0.186)	0.024 (-0.040, 0.089)	0.044 (-0.020, 0.108)	0.017 (-0.051, 0.085)
CBCL Total problems score, 6 y	-0.031 (-0.093, 0.032)	-0.021 (-0.080, 0.038)	-0.084** (-0.143, -0.025)	-0.103** (-0.169, -0.036)
<i>R</i> <sup>2</sup> , adjusted <i>R</i> <sup>2</sup>	.065***, .055	.034***, .023	.033***, .023	.025*, .014
<b>Perceived peer acceptance</b>				
Child's sex - female	0.051 (-0.008, 0.110)	0.021 (-0.037, 0.079)	0.063* (0.007, 0.120)	0.064* (0.007, 0.120)
SES, birth - high	0.007 (-0.060, 0.073)	0.034 (-0.029, 0.097)	0.036 (-0.026, 0.098)	0.077* (0.014, 0.140)
SES, birth - low	0.073* (0.006, 0.139)	-0.039 (-0.109, 0.030)	-0.025 (-0.091, 0.042)	0.055 (-0.009, 0.119)
Living multiples, 6 y	-0.084* (-0.158, -0.011)	-0.064* (-0.127, -0.002)	-0.025 (-0.087, 0.036)	-0.031 (-0.093, 0.032)
Number of siblings, 6 y	0.042 (-0.023, 0.108)	-0.011 (-0.077, 0.055)	-0.018 (-0.076, 0.041)	0.013 (-0.049, 0.076)
Special school, 8 y <sup>‡</sup>		0.055 (-0.021, 0.132)		-0.113** (-0.190, -0.035)
GA, birth	0.009 (-0.061, 0.079)	0.012 (-0.057, 0.081)	0.058 (-0.007, 0.123)	-0.004 (-0.068, 0.060)
PIRI score, neonatal / 5 months	-0.042 (-0.100, 0.016)	0.007 (-0.062, 0.076)	-0.062* (-0.120, -0.004)	-0.018 (-0.076, 0.041)
Height (cm), 6 y	0.015 (-0.043, 0.074)	0.051 (-0.009, 0.112)	-0.031 (-0.089, 0.028)	-0.071* (-0.129, -0.013)
TOMI-H Total impairment score, 6 y	-0.051 (-0.118, 0.015)	-0.172*** (-0.241, -0.104)	-0.088** (-0.155, -0.022)	-0.099** (-0.167, -0.031)
K-ABC MPC IQ score, 6 y	-0.010 (-0.080, 0.060)	-0.057 (-0.121, 0.007)	-0.043 (-0.104, 0.018)	0.012 (-0.050, 0.074)
CBCL Total problems score, 6 y	-0.035 (-0.098, 0.029)	-0.043 (-0.104, 0.018)	-0.215*** (-0.276, -0.154)	-0.164*** (-0.224, -0.104)
<i>R</i> <sup>2</sup> , adjusted <i>R</i> <sup>2</sup>	.023*, .012	.042***, .031	.085***, .075	.085***, .075

Statistical significance of standardized regression coefficients  $\beta$  based on Student's  $t$ -tests, statistical significance of explained variance  $R^2$  based on  $F$ -tests. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ . Multiple regression models were adjusted in case of heteroscedasticity using heteroscedasticity-consistent standard error estimators (44, 45). Models were adjusted for children's school entry status at 6 years of age. PIRI: Parent-Infant Relationship Index; TOMI-H: Test of Motor Impairment - Henderson Revision; K-ABC: Kaufman - Assessment Battery for Children; MPC: mental processing composite; CBCL: Child Behavior Checklist. † The variable *Special school, 8 y* was included as a predictor in regression models at 8-year assessments.