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Running head: Best friendships and secondary school transition

Title: ‘Best friends forever’? Friendship stability across school transition and associations with mental health and educational attainment

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Abstract

Background: Friendships have been linked to mental health and school attainment in children. The effects of friendlessness and friendship quality have been well researched but less is known about the role of friendship stability (i.e., maintaining the same friend over time), an aspect of friendship which is often interrupted by the transition between phases of schooling. Many children report concerns about the secondary school transition which introduces a number of new social and academic challenges for children. **Aims:** To explore rates of friendship stability and whether maintaining a stable best friend across the primary to secondary school transition provided benefits to children's adjustment during this period. **Sample:** Data were from 593 children (*Age* = 11 years 2 months). **Methods:** This study used longitudinal data from children transitioning into 10 UK secondary schools and explored the association between self-reported friendship stability and three outcomes: academic attainment, emotional problems, and conduct problems. Analyses controlled for friendship quality and pre-transition psychological adjustment or attainment as appropriate. **Results:** Rates of friendship stability were relatively low during this period. Children who kept the same best friend had higher academic attainment and lower levels of conduct problems. Exploratory analyses indicated that secondary school policies that group children based on friendships may support friendship stability. **Conclusions:** Helping maintain children's best friendships during the transition to secondary school may contribute to higher academic performance and better mental health.

Keywords: friendships; school transition; mental health; academic attainment; conduct problems.

Early adolescence comprises multiple social, psychological and biological transitions exemplified by the onset of puberty and moving from primary to secondary school (Steinberg, 2016). Not all young people thrive during adolescence, as indicated by an increase in mental health problems, particularly amongst girls (Costello, Copeland, & Angold, 2011; Viner et al., 2012), and a decline in academic motivation, which tends to be larger amongst boys, in this period (Dotterer et al., 2009; Schneider et al., 2008). Difficulties in this period may foreshadow poorer long-term functioning later in life in key domains such as academic attainment, occupational success and mental health (Ek, Sovio, Remes, & Jarvelin, 2005; Ng-Knight & Schoon, 2017; West, Sweeting, & Young, 2010). Social support has been identified as an important protective factor for mental health and social functioning (Feeney & Collins, 2015; Rutter, 2013), yet the secondary school transition is typified by the disruption it inflicts on children's social networks as they change schools. Prior research indicates that peers influence children's school grades and behavioural problems (i.e., socialisation effects) and that this influence is not explained by the friendship choices children make (i.e., selection effects; Fortuin, van Geel & Vedder, 2015; Gifford-Smith et al., 2005; Yeung & Nguyen-Hoang, 2016). Peers have also been the target of intervention efforts aiming to improve the mental health of school pupils (Coleman, Sykes, & Groom, 2017; Weare & Nind, 2011). Notably, of all the peers children interact with at school, it is their friends that exert the strongest effects on academic outcomes (Yeung & Nguyen-Hoang, 2016).

Good quality friendships provide children with companionship and support and are associated with a range of developmental advantages including better mental health and academic functioning (Berndt & Keefe, 1995; Hartup, 1989; Ladd, Kochenderfer, & Coleman, 1996; Parker & Asher, 1993; Windle, 1994). Equally, the loss of a significant friendship increases risk for subsequent emotional problems in children and adolescents

(Goodyer, Germany, Gowrusankur, & Altham, 1991; Goodyer, Wright, & Altham, 1989; Monroe, Rohde, Seeley, & Lewinsohn, 1999). While good quality relationships with family members also support positive development, friendships differ in important ways. For instance, they are more likely to be egalitarian and voluntary and, in particular, are much more liable to dissolution (Hartup, 1989). As such, it is important to consider two key aspects of friendships simultaneously: quality which refers to the levels of positive and negative features in a friendship (e.g., intimacy vs conflict, respectively; Berndt, 2002) and stability which refers to the temporal stability of a friendship (Poulin & Chan, 2010). Understanding factors affecting the stability of good quality friendships in particular may shed light on mechanisms by which children's mental health and academic outcomes can be supported.

Schools are a key environment for the formation and maintenance of children's friendships (Oswald & Clark, 2003). Substantive changes in schooling occur when children move between different phases of schooling, for example from a primary/elementary school to a secondary school (Eccles, Wigfield et al., 1993; World Bank, 2006). Indeed, common concerns reported by children at this time reflect friendships and social aspects of the new school environment with losing old friends being a common and persistent concern (Pratt & George, 2005; Rice, Frederickson, & Seymour, 2011). The extent to which these concerns are borne out by reality, and the proportions of children that lose friendships over this transition period is not currently known. However, it is logical to expect many friendships will be disrupted by the secondary school transition as children have most of their friends at school and many friends will not transition to the same school. Thus, the first aim of this study is to examine rates of friendship stability over the secondary school transition. We also examine aspects of pre-transition child and friendship functioning that might identify children who are more likely to lose friends over this period.

Stable friendships are associated with better school behaviour and grades but this has not yet been investigated over the school transition period (Berndt & Keefe, 1995), a potentially stressful period of imposed change when social support may be particularly beneficial (Symonds & Galton, 2014). One of the important features of good quality friendships is that they provide emotional support in challenging situations such as school transitions (Berndt, 1989; Berndt & Murphy, 2002; Poulin & Chan, 2010). As such, stable friendships that are also high quality may be expected to confer beneficial effects on mental health outcomes over the transition to secondary school – a period recognised as challenging, involving a degree of apprehension for all pupils and where difficulties may have long-lasting effects on functioning and mental health (Eccles, Wigfield et al., 1993; West, Sweeting, & Young, 2010). Prior research has shown that stable friendships are only beneficial if they are high quality, so there is little reason to believe stable friendships that are low quality will be of benefit (Berndt, 1989; Flannery & Smith, 2017; Poulin & Chan, 2010). In addition, there is a substantial literature that documents the beneficial effects of close, supporting social relationships and the deleterious effects of unsupportive, conflicted social relationships on children's mental health and wellbeing (e.g., Goodyer et al., 2000; Rueter et al., 1999; Wade & Kendler, 2000). For instance, poor quality friendships have been identified as a risk factor for the onset and persistence of depressive disorders in school-aged children (Goodyer et al., 1989; Goodyer et al., 1991). Retrospective reports of social difficulties during the secondary school transition have been linked to poorer mental health (West et al., 2010), but school transition research has not yet paid attention to the impact of friendship stability and loss on children's mental health and academic attainment in prospective study designs. Therefore, the second aim of this study was to examine whether friendship stability is associated with better mental health and academic attainment and also test whether this was dependent on the quality of children's friendships.

Prospective longitudinal studies have illustrated the benefits of stable, supportive relationships for desistence of antisocial behaviour in adults (e.g., Sampson & Laub, 1993). Such study designs are important for the study of putative friendship effects because relationships not only exert influence on individuals (i.e., socialisation effects) but relationships themselves are often a product of individuals' characteristics (e.g., homophily and selection effects; Rutter, 2007). The only currently available data on early adolescents suggests that stable friendships are correlated with higher school grades (r range = .14 – .17) and lower levels of disruptive behaviour (r range = -.12 – -.17; Berndt & Keefe, 1995), but this association has not yet been investigated in a design that examines changes in mental health and school attainment over time, or takes friendship quality into account. The current study is novel in assessing friendship stability and its association with important functional outcomes across a period of school transition, a challenging period of adaptation where the potentially protective effects of friendships are likely to be particularly important. Furthermore, the school transition acts to some extent like a 'natural experiment' which pulls apart variables that ordinarily go together (Rutter, 2007), such as friendship stability and quality which tend to be positively correlated (Poulin & Chan, 2010). Thus, during the transition, children may be more likely to lose best friends prematurely due to imposed school change rather than conflict or low quality relationships which may be the prevailing reasons under normal circumstances (Rutter, Maughan, Mortimore, Ouston, & Smith, 1979). Some commentators have suggested that the secondary transition may be a good opportunity to break ties with low-quality friendships because of the negative effects these can have (Pratt & George, 2005; Wark, 2011). However, little is known about what might be done to proactively maintain high-quality friendships and whether doing so has desirable effects. The school transition period presents an opportunity for examining how schools may influence the

stability of children's friendships and consequently offers insight into potential avenues for intervention.

While all primary and secondary schools in the UK employ some measures to support pupils making the transition from primary to secondary school, it is recognised that there is considerable between-school variation in the approach taken (Roberts, 2015). Strong links between primary and secondary school staff are recognised as important for the transition process (Evangelou et al., 2008; Neal, Rice, Ng-Knight, Riglin, & Frederickson, 2016). With regard to friendships specifically, secondary schools vary in the extent to which they actively support pupil friendships during transition and teachers appear to differ in their attitudes about the importance of maintaining existing friendships across the transition compared to forming new friendships at secondary school (Keay, Lang, & Frederickson, 2015). For example, when deciding which pupils to allocate to each class/form group, some schools encourage children and parents to nominate friends that they would like to remain with, while other schools do not allow input from children and parents (Keay et al., 2015). Allowing children to choose which friends they would like to be in a class with has the potential to help children maintain their friendships across the school transition, but the effects of such policies is unknown. Thus, our third aim was to test the association between school policies that promote friendships and friendship stability.

In a prospective, longitudinal study of UK schools, we asked the following:

1. How stable are children's friendships across the transition from primary school to secondary school and are aspects of child and friendship functioning associated with friendship stability and loss?
2. Is friendship stability related to academic and mental health outcomes? Do these associations depend on friendship quality?
3. Are school transition procedures related to friendship stability?

Method

Procedure and participants

Participants were recruited from 10 secondary schools in the South East of England which were selected to be broadly representative of the region's secondary schools in terms of examination pass rates, and proportions of pupils from minority ethnic and economically disadvantaged backgrounds (Ng-Knight et al., 2016). Ethical approval for the study was given by the university ethics committee. Data were collected from children on two occasions, one year apart. Pupils assented to participate in the study and parents were given the option to withdraw pupils from the study on each occasion. Before participation, research assistants explained the study's aims and procedures to the whole class and each pupil was provided with an information sheet containing study information and details of who to contact for more information. It was explained that participants were free to withdraw without explanation and at any time, were free to skip any questions they did not want to answer, and that all answers were confidential. School record data were obtained for all participating children unless their parents/carers had opted out of the study or data sharing. The first assessment (baseline) took place during the last term of the last year of primary school (*M age* = 11 years 2 months); the follow-up assessment took place one year later during the last term of the first year of secondary school (*M age* = 12 years 3 months). At baseline, children who were due to start at the participating secondary schools in the next academic year (i.e., prospective pupils) were sent questionnaires to their home address by post (children attended 135 primary schools, which prohibited direct data collection at the primary school assessment). At follow-up, questionnaires for pupils were collected at in-class assessments in the secondary schools. Academic attainment data were collected from school records at the end of the first year of secondary school.

Seven hundred and fifty children participated at baseline and 593 of these participated again at follow-up. Of the 157 who did not participate at follow-up this was due to attending a different secondary school (N = 61), the child withdrawing from the study (N = 15), the child being withdrawn by parents (N = 12), the child being absent from school on the assessment day (N = 36), and incomplete assessment data (N = 33). The participation rate for in-class assessments at follow-up (86%) was higher than that for questionnaires returned by post at baseline (36%). Non-response to the postal assessments was associated with slightly lower academic attainment scores and higher levels of mental health symptoms compared to the full sample (Ng-Knight et al., 2016). The analyses reported here primarily focused on data from the subsample of children (N=593) with complete data on self-reported friendships pre- and post-transition.

Measures

Friendships. At both assessments a version of the Friendships Qualities Scale (FQS; Parker & Asher, 1993) was included in the questionnaire. This asked children to identify their best friend and was used to determine friendship stability. Children were coded as having a stable best friend if they identified the same best friend at baseline and at the one year follow-up (binary scale: 0 = unstable, 1 = stable). Friendship quality was assessed at baseline using the total score on a 12-item measure of friendship quality ($\alpha = .84$; Bukowski, Hoza, & Boivin, 1994), example items: ‘My friend helps me when I am having trouble with something’, ‘I feel happy when I am with my friend’.

For sensitivity analyses, we also used data from the FQS which asked children to identify their second and third best friends. This was used to calculate the stability of children’s top three friends (0 – 3). Friendship quality for all three friends was assessed using

a single item which separately asked how satisfied children are with each of their listed friends (see supplementary table S3 for more details).

Academic attainment. Teacher-rated attainment levels for English and Mathematics at the end of the first year of secondary school were used as an outcome measure. Scores were standardised within schools because schools differed in the grading scales they used (seven schools used an 18-point scale, two schools used a four-point scale). Data were available from nine schools. Combining standardised scores for English and Maths showed good internal consistency ($\alpha = .75$). Standardised test results in English and Mathematics taken at the end of the last year of primary school were used as baseline measures of academic attainment.

Behavioural and emotional problems. At both assessments behavioural and emotional problems were assessed by including in the questionnaire two subscales of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997): conduct problems (e.g., 'I get very angry and lose my temper', $\alpha = .62$) and emotional problems (e.g., 'I worry a lot', $\alpha = .74$). The self-report version of the SDQ is a well validated measure, showing adequate reliability and validity and performing well compared to other established measures of child psychopathology (Goodman, 1997, 2001). The current sample was similar to population norms of British 11-15 year olds (Meltzer, Gatward, Goodman, & Ford, 2000).

Secondary school transition procedures. During semi-structured interviews, secondary school staff responsible for the transition to secondary school were asked whether the school allocated children to classes based on the children's requests to be kept with specific friends (no = 0, yes = 1; Keay et al., 2015).

Statistical analysis

In order to examine the stability of children's friendships across the transition from primary school to secondary school we first examined the proportion of children nominating the same best friend at baseline and at one-year follow-up. Correlations were then calculated to examine associations between baseline characteristics of the child (academic attainment, behavioural and emotional problems, friendship quality) and subsequent friendship stability. These variables were selected given evidence that lower functioning in these areas is related to lower stability (Poulin & Chan, 2010). Potential non-linear associations between these variables and friendship stability were examined by rerunning the correlations as regression analyses with a quadratic term added for the baseline characteristics. To test if friendship stability was related to academic and mental health outcomes and whether these associations depended on friendship quality, linear regression analyses were conducted in three stages: (1) simple lagged association between friendship stability across primary/secondary school and academic/mental health outcomes, (2) controlling for prior level of the outcome variable, friendship quality and child's gender, (3) including a friendship stability-by-quality interaction term, to assess whether the associations between friendship stability and academic/mental health outcomes were dependent on friendship quality. Gender was included due to differences in the outcome variables and some prior evidence of differences in friendship stability (Poulin & Chan, 2010). Finally, to investigate whether school transition procedures were related to friendship stability, we conducted exploratory logistic regression analyses to investigate the associations between school procedures and friendship stability. All analyses were performed in Stata version 14 (StataCorp, 2015). The 'cluster' command was used to account for the clustering of data (i.e., pupils within schools).

Sensitivity analyses assessed: 1) whether results extended to a broader measure of friendship stability (number of top 3 friends kept - where greater variation in friendship *quality* might be expected); 2) the effects of missing data using inverse probability weighting

(IPW). IPW has been recommended over alternative methods for dealing with missing data (such as multiple imputation) in situations where whole blocks of data are missing for a large proportion of individuals (Seaman, White, & Copas, 2012). Weights were derived from a logistic regression analysis between a set of measures available for the majority of pupils from school records (child sex, age, school, academic attainment, special educational needs status, and free school meals entitlement) and missing data. The analyses were rerun using IPW to address potential bias caused by non-response. Using IPW revealed a similar pattern of results (see Supplementary Table S1).

Results

Stability of children's friendships across the transition from primary school to secondary school

There was substantial instability in children's friendships as they moved from primary to secondary school, with 73% reporting a different best friend one year later. About a quarter of children kept the same best friend until the end of the first year of secondary school (27%). Most of the best friends named by participants were attending the same school as the participant (i.e., 87% during primary school and 84% during secondary school), suggesting schools are an important influence on children's friendships.

Descriptive statistics and correlations for all individual-level study variables are presented in Table 1. Children with higher academic attainment ($r = .09, p < .05$), and fewer symptoms of emotional ($r = -.10, p < .05$) and conduct problems ($r = -.09, p < .05$) were more likely to have stable best friends over the transition to secondary school (see table 1). Higher quality best friendships were more likely to be stable across the transition ($r = .17, p < .001$). There was not strong evidence of quadratic associations (all $p > .05$). Thus, children who were functioning less well at primary school and whose very best friendships at primary

school were of lower quality were more likely to lose friends over this one-year transition period.

Associations between stable friendships and academic/mental health outcomes

Having a stable best friend was associated with higher academic attainment and fewer symptoms of conduct problems at the end of the first year of secondary school (see table 2). There was no evidence of an association between best friend stability and symptoms of emotional problems ($p > .05$). For attainment ($B = 0.13$) and conduct problems ($B = -0.52$), these associations were robust to controls for baseline levels of the outcome variable, friendship quality, and gender. Thus, the effects of maintaining a best friend can be interpreted as increasing academic attainment by 0.13 *SDs* and reducing conduct problems by half a symptom point (scale range 0 – 10). There was no evidence of interaction effects between best friend stability and friendship quality for any of the outcome variables (all $p > .05$). Intraclass correlations indicate that most variance in the outcomes is within schools rather than between schools (ICCs: attainment = 0.04, $p < .05$; emotional problems = 0.001, $p = .39$; conduct problems = 0.005, $p = .26$).

Are school procedures associated with friendship stability?

Two secondary schools used friendship requests to allocate children to form groups and these schools tended to have higher levels of best friendship stability (35% and 32%; $M = 33%$) than the schools that did not allow friend requests ($M = 25%$). Children in these schools were, on average, 50% more likely to have stable best friends compared to children in the other schools, OR [95%CI] = 1.50 [1.09, 2.05].

Sensitivity analyses

Similar results were observed for the main analyses when using inverse probability weighting, where friendship stability was associated with higher attainment and lower conduct problems (see supplementary table S1).

As might be expected, children rated their second and third ‘best’ friends as lower quality compared to their very best friend (see supplementary table S2) showing that the broader measure of friendship stability (stability of children’s top three friends) contains greater variation in friendship quality (i.e., some friendships are rated as of moderate quality) and may therefore be a better measure for testing interactions between stability and quality. For conduct problems and academic attainment, associations with friendship stability were similar but slightly attenuated for this broader measure of friendship stability (supplementary table S3). For emotional problems, results were different for the broader measure of friendship stability such that there was an interaction between friendship stability and quality where maintaining low quality friendships was related to higher levels of emotional problems, but there was no beneficial effect of maintaining a greater number of high quality friendships on emotional problems (supplementary table S4).

Discussion

In this prospective longitudinal study over the transition to secondary school, we found substantial instability in children’s self-reported friendships. Only a quarter of children maintained their very best friendship over this transition. For those who did maintain the same best friend, there were beneficial associations with aspects of their mental health, namely conduct problems, and their academic attainment. Exploratory analyses suggested that secondary school policy regarding how children are allocated to classes is associated with the stability of children’s friendships.

Moving to secondary school introduces a number of new experiences and challenges for children and often co-occurs with the biological and social changes associated with the onset of puberty (Bowker, 2010; Eccles, Midgely et al., 1993; Eccles, Wigfield et al., 1993; Pratt & George, 2005). Losing friends is consistently rated as one of the areas of greatest concern by children transitioning to secondary school (Rice et al., 2011) and pupils remain concerned about friendship loss throughout their first year of secondary school (Rice et al., 2015). The findings of the current study lend credence to these concerns, given that three quarters of children no longer had the same best friend over this period. Early adolescence has been noted as a period of substantial friendship instability and this is believed to be partially due to school transitions that typically occur during this time (Poulin & Chan, 2010). For instance, Berndt & Keefe (1995) found best friend stability was much higher (63%) during a period that did not include transitioning between schools, suggesting the secondary school transition may indeed be a period of heightened friendship instability. The current study provides an important contribution by publishing the first data, to our knowledge, on rates of stability across the secondary school transition.

Friendships fulfil a number of important functions for young adolescents, influencing feelings of self-worth and buffering against life stress (Price, 1998; Rose, 2002; Sullivan, 1953). Theoretical perspectives on resilience typically consider social support, such as that provided by a best friend, an important protective factor for understanding individual differences in psychopathology and responses to stressful events (Masten & Garmezy, 1985; Rutter, 2013). As such, the social support afforded by stable friendships is likely to be an important resource for children experiencing the turbulence of school transitions during early adolescence (Symonds & Galton, 2014). This view was supported by our findings which show that children who maintained their best friendship across the transition had better academic progress and fewer conduct problems. This is consistent with previous research which found

friendship stability within a single school year correlates with higher grades and less disruptive behaviour (Berndt & Keefe, 1995) and effect sizes for the simple correlations were very similar in the current study. However, we extend this earlier work by examining these effects longitudinally during a between-school transition and by showing associations were robust to a number of statistical controls. Specifically, we found that effects were not entirely driven by characteristics of the child, such as previous academic success and mental health, or by characteristics of their friendships (e.g., due to children with stable friendships having especially good quality friendships). In sum, stable best friendships are linked to better adaptation to secondary school in terms of academic attainment and conduct problems.

We did not find evidence of best friend stability conferring benefits for children's emotional functioning during the secondary school transition. However, sensitivity analyses of a broader measure of friendship stability (number of top 3 friends kept) found an interaction between friendship quality and stability such that maintaining a greater number of lower quality friendships was associated with increased emotional problems. This is consistent with observations that poor and moderate quality friendships may be risk factors for depressive disorders in school-aged children (Goodyer et al., 1989; Goodyer et al., 1991) and recommendations that ameliorating poorer quality friendships may be an important therapeutic focus for children experiencing emotional difficulties (Goodyer, Herbert, Tamplin, Secher, & Pearson, 1997). To some extent, these findings point to an issue many teachers are already aware of as secondary schools often place pupils in separate classes where primary school teachers have identified problematic relationships (Keay et al., 2015).

Schools carry out a variety of procedures designed to smooth the transition to secondary school for pupils. Although the primary purpose of these is to settle children in to the new learning and academic demands of secondary school, they are also directed towards assisting children with the associated social changes (Keay et al., 2015). Exploratory analyses found

preliminary evidence to suggest that procedural amendments may aid prevention of mental health problems in children. Specifically, incorporating children's friendship preferences into the configuration of their secondary school form groups may increase best-friend stability, which, in turn, was found to be associated with reduced levels of conduct problems and increased academic attainment. These findings are preliminary given the small number of schools that actively attempted to support friendship stability. Finally, findings identified children with pre-existing emotional and conduct problems and lower academic attainment are at higher risk of losing best friends. There may therefore be value in supporting friendships among these children.

Some limitations of the current study deserve note. The participation rate at baseline was lower than that at follow-up and, for inclusion in this analysis, friendship data at baseline were required. This group of pupils was performing slightly higher academically than the sample as a whole. Nevertheless, the subsample included children from the full academic attainment distribution (from those below the minimum National Curriculum level of 2 up to the highest level of 6) and, on most measures, this subsample was similar to the local population from which it was drawn, including socio-economic disadvantage, ethnic composition, and proportion of participants with identified special educational needs. Teacher estimates of attainment are potentially less accurate than those from standardised tests, however, there was a strong correlation between teacher estimated attainment scores at follow-up and the standardised attainment tests taken at baseline ($r = .80$) and their use is common in the research literature (e.g., Deighton et al., 2017). Crucially, children in the UK do not complete formal examinations until age 16, thus teacher assessments provide key data for this period. The sensitivity analyses looking at children's top three friends still only partially captured friendship groups as the average number of nominations usually exceeds three when using unlimited nomination procedures. Finally, the participating children came

from a small number of secondary schools. Nonetheless, this study provides useful preliminary data indicating directions for future research on how school-level characteristics might influence the stability of children's friendships.

Conclusion

Maintaining a stable best friend is associated with some mental health and academic benefits for children during the transition to secondary school, an important period of adaptation that is stressful for many and which predicts children's longer-term outcomes. The procedures schools employ for supporting existing friendships over the transition are linked to rates of friendship stability and deserve more research attention.

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Table 1. *Descriptive statistics and correlations for main individual-level study variables.*

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.
1.Best friend stability	0.27	0.45	1.00							
2.Best friend quality	48.99	7.24	.17***	1.00						
3.Academic attainment (baseline)	4.32	0.67	.09*	-.02	1.00					
4.Academic attainment (follow-up)	0.19	0.86	.13**	-.03	.79***	1.00				
5.Conduct problems (baseline)	1.40	1.51	-.09*	-.15***	-.09*	-.11**	1.00			
6.Conduct problems (follow-up)	1.48	1.58	-.18***	-.02	-.11**	-.16***	.46***	1.00		
7.Emotional problems (baseline)	2.10	2.11	-.10*	-.01	-.18***	-.11**	.28***	.22***	1.00	
8.Emotional problems (follow-up)	2.10	2.15	-.06	.08 [†]	-.03	.02	.17***	.30***	.56***	1.00
9.Female sex (male reference)	0.52	0.50	-.02	.26***	-.01	.06	-.17***	-.14**	.18***	.27***

Note. Columns "1." to "8." show correlations. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2. *Associations between friendship stability and children's post-transition functioning.*

Outcome variable:	Unadjusted		Adjusted ^a	
	B[95% CI]	β	B[95% CI]	β
Academic attainment	0.25 [0.06, 0.43]	0.13	0.13 [0.03, 0.24]	0.07
Emotional problems	-0.29 [-0.69, 0.11]	-0.06	-0.06 [-0.37, 0.26]	-0.01
Conduct problems	-0.65 [-0.89, -0.41]	-0.18	-0.52 [-0.72, -0.31]	-0.15

Note. B=unstandardised regression coefficients; CI=confidence intervals; β =standardised regression coefficients; ^a=model adjusted for equivalent measure of functioning at primary school, friendship satisfaction at primary school, gender. N=544–591.

Table S1. *Missing data sensitivity analyses - associations between friendship stability and children's post-transition functioning using inverse probability weighting.*

Outcome:	Best friend stability	
	Unadjusted B[95% CI]	Adjusted ^a B[95% CI]
<i>Model 1: Data weighted for child's age, sex and school.</i>		
Academic attainment	0.25 [0.07, 0.40]	0.13 [0.03, 0.24]
Emotional problems	-0.31 [-0.71, 0.09]	-0.05 [-0.36, 0.25]
Conduct problems	-0.65 [-0.89, -0.42]	-0.53 [-0.73, -0.33]
<i>Model 2: Data weighted for child's age, sex, school, attainment, special educational needs and free school meal status.</i>		
Academic attainment	0.23 [0.06, 0.39]	0.12 [0.02, 0.22]
Emotional problems	-0.25 [-0.68, 0.17]	-0.03 [-0.35, 0.29]
Conduct problems	-0.63 [-0.84, -0.41]	-0.52 [-0.71, -0.33]

Notes. B =unstandardised regression coefficients; CI=confidence intervals; ^a = model adjusted for equivalent measure of functioning at primary school, friendship satisfaction at primary school, gender.

Data in model 1 draw on inverse probability weights derived from data available for 2,041 children. The Hosmer-Lemeshow test was used assess the fit of the missingness model, with results showing no indication of poor fit (Hosmer-Lemeshow $\chi^2(8) = 3.18$, $p = 0.92$). Weights ranged from 1.30 to 1.61.

Data in model 2 draw on inverse probability weights derived from data available for 1,508 children. The Hosmer-Lemeshow test was used assess the fit of the missingness model, with results showing no indication of poor fit (Hosmer-Lemeshow $\chi^2(8) = 13.29$, $p = 0.10$). Weights ranged from 1.13 to 2.16.

Table S2. *Descriptive statistics for friendship quality ratings of first best, second best, and third best friends at baseline (M age=11 years 2 months).*

Friend	<i>M</i>	<i>SD</i>	Response frequencies (%)				
			☹️/1	☹️/2	😊/3	😊/4	😊😊/5
1. First best	4.83	0.48	0.5	0.2	0.8	13.0	85.5
2. Second best	4.58	0.60	0.3	0.3	2.8	33.7	62.8
3. Third best	4.44	0.64	0.4	0.5	4.3	43.2	51.6

Note. All pairwise t-test comparisons show that mean quality ratings of any two types of friends were significantly different at $p < .001$.

Table S3. *Associations between stability of top three friends and children's post-transition functioning.*

Outcome variable:	Unadjusted		Adjusted ^a	
	B[95% CI]	β	B[95% CI]	β
Academic attainment	0.16 [0.09, 0.23]	0.16	0.06 [-0.01, 0.13]	0.06
Emotional problems	0.08 [-0.10, 0.25]	0.03	0.26 [0.10, 0.42]	0.10
Conduct problems	-0.18 [-0.32, -0.04]	-0.09	-0.14 [-0.34, 0.07]	-0.07

Note. B=unstandardised regression coefficients; CI=confidence intervals; β =standardised regression coefficients; ^a=model adjusted for equivalent measure of functioning at primary school, friendship satisfaction at primary school, gender.

Table S4. *Interaction models for stability of top three friends and children's post-transition functioning.*

Outcome:	Stability		Quality		Stability*Quality	
	B[95% CI]	β	B[95% CI]	β	B[95% CI]	β
Academic attainment	-0.47 [-1.32, 0.39]	-0.45	-0.13 [-0.28, 0.02]	-0.07	0.11 [-0.07, 0.30]	0.51
Emotional problems	2.52 [0.76, 4.28]	0.95	0.24 [-0.12, 0.59]	0.05	-0.49 [-0.88, -0.09]	-0.86
Conduct problems	-0.49 [-2.14, 1.16]	-0.25	-0.19 [-0.45, 0.06]	-0.06	0.08 [-0.25, 0.40]	0.18

Note. B=unstandardised regression coefficients; CI=confidence intervals; model is adjusted for equivalent measure of functioning at primary school, gender.