

The transition from primary to secondary school in mainstream education for children with autism spectrum disorder

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Abstract

The transition from primary to secondary education (hereafter 'school transition') is a major ecological shift that poses considerable social, emotional, academic and organisational challenges. It is commonly assumed that this school transition is especially difficult for children with autism spectrum disorder, but that idea is mainly based on anecdotal evidence and requires systematic investigation. We describe change and continuity for children with autism spectrum disorder ($N=28$, mean age = 11.29 years, mean full-scale IQ = 87.86) transitioning in mainstream education from primary to secondary school. Levels of psychopathology, adaptive functioning and peer victimisation were measured by parent, self and teacher report in the last year of primary school, and again after one term of secondary school. At follow-up, all participants were still in their secondary school, and there was no evidence for a marked escalation of difficulties during the transition. Instead, we observed high levels of psychopathology and maladaptation at baseline which persisted across the transition and were in some cases under-recognised. By parent report, levels of bullying fell from primary to secondary school. Future research should investigate factors, such as school characteristics, that influence the move to secondary education in autism spectrum disorder, to inform the development of interventions to promote successful school transition.

Keywords

autism spectrum disorder, education, longitudinal, school transition

Autism spectrum disorder (ASD) is a lifelong, neurodevelopmental condition that affects approximately 1% of the population (Baird et al., 2006). It is characterised by core impairments in social reciprocity, social communication and flexibility, as well as a constellation of associated difficulties, including problems with executive function, sensory sensitivity, emotional and behavioural regulation, language, motor control and eating (American Psychiatric Association (APA), 2013). Clinicians and researchers are increasingly aware of the strengths shown by people with ASD. For example, it is now known that most people on the autistic spectrum have an IQ in the normal range and that many individuals with ASD have areas of significant cognitive strength (Howlin et al., 2009). Nevertheless, adult outcomes for people with ASD are currently among the worst for any mental disorder, characterised by exclusion from the labour market, social isolation, high rates of mental disorder, dependence on parental support and poor quality of life (Howlin and Moss, 2012). There is an urgent

need to understand better the processes that underpin ASD's poor prognosis, to inform intervention (Pellicano et al., 2014).

In the United Kingdom and North America, children with ASD are increasingly receiving their education in mainstream school, reflecting a policy of inclusion, designed to promote the rights of people with special needs. In the United States, between 1991 and 2009, the proportion of children with autism spending substantial time in mainstream classrooms rose from 12% to 59% (Snyder and

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Dillow, 2012). In Britain, the majority (71%) of children diagnosed with ASD attend mainstream school (Department for Education, 2012). Our experience as clinicians, and evidence from the empirical literature, suggests that most children with ASD encounter considerable challenges in mainstream school settings. For example, children with ASD are at elevated risk of being bullied at school (Sterzing et al., 2012), of having teacher-reported emotional and behaviour problems (Kaat et al., 2013), of school exclusion (Donno et al., 2010) and of showing lower-than-expected academic attainment given their IQ (Jones et al., 2009). There appear to be substantial barriers to the successful integration of people with ASD into mainstream schools, and a better understanding of these barriers is needed to promote inclusion.

In this study, we investigate the impact on people with ASD of one specific challenge within mainstream education: the transition from primary to secondary education, hereafter labelled the 'school transition'. In both the United States and the United Kingdom, this happens when children are on the cusp of adolescence, typically aged 11 or 12 years. Compared to secondary schools, primary schools tend to be smaller, more local and to make fewer demands on the independence of their pupils. Children receive most of their teaching among a familiar and stable group of peers from a single-form teacher, usually in the same room. By contrast, secondary schools demand greater academic and social independence from their students. They are larger and more focused on academic assessment. Pupils are taught by different teachers in different rooms for each lesson, moving around the school campus throughout the day. Thus, the transition from primary to secondary school involves a major ecological shift, which makes a number of demands on a child's social, intellectual and organisational capacities (see Coffey, 2013 for excellent account of the differences between primary and secondary education). It can be considered one of the most challenging periods in a student's educational career (Zeedyk et al., 2003).

Although there are no published studies which have directly observed the school transition in ASD, there are several indicators, in addition to our clinical experience, that the move from primary to secondary education may be a substantial challenge for young people on the autism spectrum. Tobin et al. (2012) interviewed seven parents before and after their child with ASD completed the school transition. These parents reported high levels of anxiety about their child's capacity to meet the social and academic demands of secondary education and generally believed that support for their child during the transition had been inadequate. In general, children classed as having special needs are at high risk of having negative experiences, such as peer victimisation, during the move from primary to secondary education (Evangelou et al., 2008). Furthermore, all of the capacities that have been found to predict successful

transition in non-ASD children are impaired in many people with ASD. These include social competence, flexibility, self-regulation and strong academic attainment (Chung et al., 1998; Evangelou et al., 2003; Rudolph et al., 2001). Also, established barriers to successful transition in typically developing children include peer victimisation and high anxiety (Evangelou et al., 2003), both of which are common in children with ASD. Thus, both clinical and indirect empirical evidence suggest that primary-to-secondary school transition may be especially difficult for children with ASD. However, there is currently no systematic research that tests whether or not this is the case.

In this study, we aimed to offer the first empirical account of the transition from primary to secondary mainstream education of children with ASD. A description of school transition for people with ASD is a necessary first step towards enhancing support and could ultimately promote more successful inclusion in mainstream education. Thus, we recruited a cohort of young people with ASD in mainstream education and assessed them before and after their transition from primary to secondary school. To capture diverse outcomes relevant to judging the success of a school transition, we measured different types of psychopathology, adaptive function and levels of peer victimisation before and after the move to secondary education. Self-, parent- and teacher-report data were collected. Based on our clinical experience and the literature on school transition in non-autistic children, we tentatively predicted that the move to secondary school would be associated with an escalation of problems for children with ASD, as indexed by the following: (1) increased psychopathology, (2) reduced adaptive function and (3) increased peer victimisation.

Methods

Design

This was a longitudinal observational study. Individuals were assessed in their final year of primary school and during the second term of secondary school.

Participants

To be included in the study, children had to meet all of the following criteria: (1) making the transition from mainstream primary to mainstream secondary education within the UK state education school system in 2009 or 2010; (2) receiving education in mainstream classrooms, not a specialist ASD unit within a mainstream school; (3) receiving an ASD diagnosis from a certified mental health professional within the UK National Health Service (NHS); (4) not having a diagnosed intellectual disability; (5) living in Greater London or a part of South East England within a one hour journey from central London. Characteristics of the 28 participants meeting these criteria are presented in Table 1. Eight were diagnosed with autism,

Table 1. Characteristics of the sample (N=28).

Age in years; mean (SD)	11.29 (0.40)
Proportion male	89.3%
Proportion identified as 'White British'	77.8%
Proportion with parents 'married or cohabiting'	70.4%
WISC-IV verbal comprehension index; mean (SD)	90.46 (18.35)
WISC-IV perceptual reasoning index; mean (SD)	98.54 (16.39)
WISC-IV working memory index; mean (SD)	87.04 (15.46)
WISC-IV processing speed index; mean (SD)	82.32 (17.44)
WISC-IV full-scale IQ; mean (SD)	87.86 (17.44)

SD: standard deviation; WISC-IV: Wechsler Intelligence Scale for children, fourth UK edition.

fourteen with Asperger's disorder and six with 'ASD', which is generally used in UK services instead of the terms 'pervasive developmental disorder-not otherwise specified' or 'atypical autism'. Module 3 of the Autism Diagnostic Observation Schedule (ADOS) was administered to participants, and two scored marginally below the ADOS ASD threshold. Nevertheless, they were included in this study as parent reports and direct observation of the child confirmed that their official, NHS diagnosis was appropriate. Over half of the sample (53.6%, $n=15$) had at least one additional mental health problem recognised by a qualified NHS clinician, and four children had two or more such comorbid problems. Most commonly identified were attention-deficit hyperactivity disorder ($n=6$), anxiety ($n=4$) and conduct problems ($n=4$). While none of the young people in the sample had a *recognised* intellectual disability, three had an IQ below 70, and two of these also had a score below 70 on the Vineland's Adaptive Behavior Scale Adaptive Behavior Composite. This suggests that two of our sample had an undiagnosed intellectual disability.

In the United Kingdom, children with recognised special needs can receive different degrees of additional help in mainstream education. The lowest level is 'School Action', which involves the deployment of resources within a school to characterise and counter a child's difficulties. 'School Action Plus' is an intensification of School Action, characterised by the school seeking some external input to help a child, for example, by seeking advice from a speech and language therapist or educational psychologist. The highest level of support comes with a 'Statement of Special Educational Needs', colloquially known as a 'statement'. In this case, if it is established that a child's educational provision cannot be met by the resources within their school, additional funding can be allocated by the government. In this sample, at the time of data collection, 3 children were on School Action, 11 were on School Action Plus and 11 had a statement. The remaining three did not have official special educational provision at school.

Measures

Child characteristics prior to transition. The following measures were used to describe the sample in terms of their autistic symptomatology and intelligence prior to school transition.

The ADOS. Autistic symptomatology was assessed using the ADOS, a standardised, direct-observational measure of proven reliability and validity (Lord et al., 2000). For each participant, Module 3 was administered by psychologist or speech and language therapist, supervised by a research-reliable clinical psychologist.

Wechsler Intelligence Scale for Children, fourth UK edition. IQ was measured using the 10 core subtests of the Wechsler Intelligence Scale for Children, fourth UK edition (WISC-IV), a test of intelligence for children and adolescents. The WISC-IV is psychometrically sound and has been extensively used with children with ASD (Wechsler, 2003). It produces a full-scale IQ score as well as index scores for verbal comprehension, perceptual reasoning, working memory and processing speed.

Change and continuity across the transition. Psychopathology, adaptive function and peer victimisation before and after transition from primary to secondary school were measured as follows.

The Strengths and Difficulties Questionnaire. The Strengths and Difficulties Questionnaire (SDQ) consists of 25 items grouped into the following subscales: conduct problems, emotional problems, hyperactivity, peer problems and pro-social behaviour. Four of these subscales (all except pro-social behaviour) are summed to generate a total problems score. The SDQ is a reliable and valid instrument for measuring adaption and psychopathology in children and adolescents, providing a dimensional measure of an individual's strengths and difficulties (Goodman and Goodman, 2009). It also provides categorical information about whether a child is at risk of having a mental disorder, as each subscale has a standardised clinical threshold. These cut points were set so that approximately 10% of children in the general population score above them (Goodman, 2001). Parent-report and teacher-report versions were administered in this study.

Beck Youth Inventories – second edition. The Beck Youth Inventories – second edition (BYI-II) is a collection of self-report measures of self-concept, depression, anxiety, anger and disruptive behaviour for people aged between 7 and 18 years. It produces age-standardised t scores. In this

study, in line with the BYI-II manual, we considered t scores at least 1 SD above the mean (i.e. of 60 and above) to indicate an area of clinical concern (Beck et al., 2005). In the general population, 16% of young people would be expected to score in this range. Each component of the BYI-II has good test–retest reliability and demonstrated criterion validity compared to appropriate alternative measures (Beck et al., 2005).

The Vineland Adaptive Behavior Scales, second edition. The Vineland Adaptive Behavior Scales, second edition (VABS-II; (Sparrow et al., 2005) is an interview measure of adaptive behaviour in Socialisation, Communication and Daily Living, which has been widely used with people with ASD. It outputs age-normed standardised scores, with a mean of 100 and a SD of 15. Individuals scoring at least 1 SD below the population mean (i.e. 85 or lower) are considered to have ‘low’ levels of adaptive function requiring clinical attention (Sparrow et al., 2005). Of the children in the general population, 15% score in the VABS-II ‘low’ range. The VABS-II has good inter-rater and test–retest reliability, and well-established criterion validity with respect to other well-established measures of adaptive behaviour (Sparrow et al., 2005). In this study, researchers administered both parent and teacher versions of the VABS-II.

Schwartz Peer Victimization Scale (SPVS). The Schwartz Peer Victimization Scale (SPVS) is a five-item measure of perceived peer victimisation. Items relate to both relational and overt victimisation, and are rated according to frequency over the last 2 weeks. Internal consistency of the self-report version is good (Cronbach’s $\alpha=0.75$), and a stable single factor measured by the SPVS correlates positively with teacher ($r=0.32$) and peer ($r=0.39$) reports of victimisation (Schwartz et al., 2002). In order to yield ratings from parents that were comparable to young person ratings, all parents were asked to complete a revised parent version of the SPVS. Question wording was altered as appropriate. For example, the question ‘How often to other kids bully or pick on you?’ was altered to ‘How often to other kids bully or pick on your child?’.

Procedure

The study was reviewed and approved by an NHS ethics committee. Informed consent was sought from all parents. In addition, only young people who gave informed assent were recruited into the study. The study was advertised in NHS child and adolescent mental health services, publications and websites aimed at parents of children with ASD and via support groups run by autism charities for young people with ASD and their parents.

While we aimed to conduct the baseline assessment in the same calendar year that participants made the school transition, in order to reduce pressure on the research team by spreading assessments, some individuals ($N=4$)

received their baseline assessment early, at the end of the first term of their last year in primary school. All follow-up assessments were conducted while the child was in their second term of secondary school. The mean interval between baseline and follow-up assessment was 9.32 months ($SD=3.10$).

It was only possible to collect pre- and post-transition school-report data for 71% of the sample ($N=20$). One child had neither baseline nor follow-up school data. In a further three cases, we were unable to attain data at the baseline school assessment, and for another four participants, it was follow-up data that were lacking. We compared the eight people missing from the school analyses with the rest of the sample, to look for systematic attrition. These analyses only have the power to detect very large effects, but it was notable that there were no apparent trends towards the children with missing school data having different levels of problems on the ADOS total score ($p=0.984$) or on parent-report SDQ and VABS-II at baseline or follow-up (all p ’s >0.362).

When selecting the appropriate person to provide school data, we requested that the informant be the school worker with most knowledge of the child. At the baseline assessment, school information was provided by class teachers ($n=11$, 55% of sample with teacher data), learning support workers ($n=6$, 30%), Special Educational Needs Coordinators (SENCOs; $n=2$, 10%) and a head teacher ($n=1$, 5%). At follow-up, school informants were class teachers ($n=4$, 20%), learning support workers or specialist ASD assistants ($n=6$, 30%) or the school SENCO ($n=10$, 50%).

Analyses

Effect sizes were calculated as Cohen’s d , corrected for the association between pre- and post-transition scores (Morris and DeShon, 2002). Paired sample t -tests were used to investigate changes in group means. In the parent- and self-report data, these had sufficient ($>80\%$) power to detect medium effects (Cohen’s $d=0.57$) and above. In the teacher-report data, they were powered for large (Cohen’s $d=0.66$) effects. Associations between continuous variables were tested using Pearson’s correlations.

We used the pre-established, standardised cut points (described above, in the ‘Measures’ section) to identify individuals scoring in the clinical range on measures of psychopathology (SDQ, BYI-II) and adaptive function (VABS-II). Changes over time in the proportion of children scoring in the clinical range were investigated using McNemar’s test. Also, to get a sense of whether rates of psychopathology and adaptive function impairment were elevated in this sample, two-tailed chi-squared or Fisher’s exact tests were used (depending on whether frequency counts were below five) to analyse whether

more participants scored in the clinical range than would be expected in the general population.

Results

Psychopathology

Data on levels of psychopathology before and after the secondary school transition are presented in Table 2, by parent, teacher and child reports. The SDQ is designed so that approximately 10% of children in the general population score in the clinical range on each of its subscales. Parents reported high levels of psychopathology in their children: At both primary and secondary schools, significantly more than 10% of the sample scored in the clinical range for the total problems scale, and on all subscales of the SDQ (all p 's < 0.05) except for conduct problems at baseline and follow-up. Teachers also reported high levels of child psychopathology, with more than 10% of children scoring in the clinical range on the SDQ total problems score at both time points in this study. This reflected elevated rates of school-reported emotional problems (at secondary school) and peer problems (primary and secondary school), as well as low levels of pro-social behaviour (primary school; all p 's < 0.05). In contrast to parent and teacher reports, the children in this study did not self-report high levels of psychopathology. On each subscale of the BYI-II, the proportion of children scoring in the clinical range was no higher than would be expected in the general population (all p 's > 0.32).

As is shown in Table 2, according to parent, teacher and child reports, there was substantial continuity between primary and secondary school in terms of psychopathology. On the parent-reported SDQ, correlations between primary and secondary school scores tended to be large (for five of six scales, $r \geq 0.59$), and there was no evidence of group level change over time in mean scores or proportion in the clinical range. By teacher report, the correlation between SDQ total problems score at primary and secondary school was high and there was no significant change in average score or the proportion of children in the clinical range on any SDQ subscale. Similarly, child-reported anxiety, depression, anger and disruptive behaviour on the BYI-II showed high correlations between primary and secondary school and the levels of these problems as reported by children in this study did not change during the school transition.

Adaptive function

As is shown in Table 3, parents and teachers reported high rates of adaptive function difficulties for the children in this study. On all but one of the VABS-II scales, by parent and teacher report at both time points, more children scored in the clinical range (below a standard score of 85) than would

be expected in the general population (all p 's < 0.05). The one exception to this was for teacher-reported VABS-II communication at primary school, where there was only a trend ($p = 0.08$) towards there being an excess of children scoring in the clinical range.

By parent report, there was a picture of continuity on the VABS-II, with socialisation, daily living and the adaptive behaviour composite all showing substantial and significant correlations between primary and secondary school. Also, there was no evidence for a change in the level of parent-reported adaptive function during the school transition. In contrast, the teacher-report VABS-II data did suggest some worsening of adaptive function across the transition, with children scoring substantially lower at secondary school compared to primary school on the adaptive behaviour composite. This partly reflects a lower mean score on the VABS-II communication scale at secondary school compared to primary school.

Peer victimisation

The parent-report bullying data showed an overall decrease in peer victimisation between primary and secondary school assessments, and no association between victimisation at primary and secondary school. To understand this finding better, we conducted an exploratory analysis to examine change between primary and secondary school on each of the five items that make up the peer victimisation scale. The overall reduction in parent-reported peer victimisation reflects a drop in the amount of name calling ($p = 0.028$), teasing ($p = 0.002$) and exclusion ($p = 0.008$). By contrast there was no significant decrease in reported sexual or physical bullying. There was a non-significant trend ($p = 0.105$) towards a reduction in self-reported peer victimisation between primary and secondary school (Table 4).

Discussion

We sought to characterise change and continuity during the transition from primary to secondary school of children with ASD who are in mainstream education. To this end, we used parent, teacher and child reports to assess psychopathology, adaption and peer victimisation as participants approached the end of primary school and again after one term of secondary school. Clinical experience, the reports of parents (Tobin et al., 2012) and a reading of the literature concerning non-ASD children (e.g. Coffey, 2013) lead us to suspect that the move from primary to secondary school would be challenging and may be associated with an escalation of difficulties in some children with ASD.

Our findings are not consistent with this expectation that the ecological shift from primary to secondary mainstream education would precipitate a marked increase in problems. None of the participants' educational placements broke

Table 2. Psychopathology before and after the school transition.

	Time 1 – end of primary school		Time 2 – start of secondary school		Cohen's <i>D</i>	Significance of <i>t</i> -test	Pearson correlation	Significance of McNemar's test
	Mean (<i>SD</i>)	% in clinical range	Mean (<i>SD</i>)	% in clinical range				
Parent report (<i>N</i> =26) ^a								
Strengths and Difficulties Questionnaire								
Hyperactivity	5.62 (2.98)	46.2%	5.77 (2.55)	42.3%	0.08	0.700	0.75***	1
Emotional problems	5.23 (2.75)	65.4%	5.08 (2.83)	53.8%	-0.05	0.802	0.38	0.453
Peer problems	5.19 (2.45)	65.4%	5.42 (2.21)	84.6%	0.11	0.581	0.60**	0.125
Conduct problems	2.69 (1.93)	30.8%	2.35 (1.85)	23.1%	-0.22	0.280	0.65***	0.625
Pro-social behaviour	5.62 (1.55)	50.0%	6.15 (2.51)	38.5%	0.32	0.157	0.66***	0.250
Total problems score	18.62 (6.26)	69.2%	18.62 (6.52)	57.7%	0	1	0.59**	0.375
Teacher report (<i>N</i> =20)								
Strengths and Difficulties Questionnaire								
Hyperactivity	4.05 (2.80)	25%	3.95 (2.56)	15%	0.03	0.892	0.27	0.688
Emotional problems	3.85 (2.37)	20.0%	4.75 (3.08)	50.0%	0.36	0.131	0.59**	0.070
Peer problems	4.45 (2.70)	45.0%	4.37 (2.39)	40.0%	-0.03	0.887	0.46*	1
Conduct problems	2.10 (1.86)	20.0%	2.30 (2.56)	35.0%	0.08	0.727	0.38	0.375
Pro-social behaviour	4.90 (2.65)	45.0%	4.15 (1.98)	40.0%	0.25	0.284	0.16	1
Total problems score	14.45 (6.78)	50.0%	15.20 (7.48)	40.0%	0.14	0.563	0.69**	0.625
Child report (<i>N</i> =24) ^b								
Beck Youth Inventory								
Self-concept	43.08 (12.66)	12.5%	45.92 (12.01)	16.7%	0.18	0.400	0.14	1
Anxiety	50.88 (11.60)	16.7%	50.96 (16.28)	33.3%	0.01	0.976	0.57**	0.125
Depression	50.21 (12.14)	20.8%	49.50 (15.84)	25.0%	-0.06	0.786	0.62**	1
Anger	50.08 (13.59)	29.2%	46.54 (14.10)	25.0%	-0.34	0.109	0.72***	1
Disruptive behaviour	46.00 (11.04)	12.5%	43.88 (10.02)	8.3%	-0.23	0.258	0.62**	1

SD: standard deviation.

^aTwo parents did not provide data on psychopathology at follow-up.

^bOne child provided neither baseline nor follow-up psychopathology data and three provided baseline but not follow-up data.

* $p < 0.05$, ** $p < 0.01$ and *** $p < 0.001$.

down during the study period. Parents, teachers and the children with ASD did not report any overall increase in psychopathology over the transition period. Also parents did not observe a decline in the adaptive function of their children as they moved from primary to secondary school. Our analyses were powered to detect medium to large, but not small, changes in group means over time. Therefore, it is possible that there were some subtle shifts in levels of

psychopathology and adaption that occurred in this study but which did not reach the threshold for significance.

Contrary to expectations (Tobin et al., 2012), in this sample parent-reported levels of peer victimisation actually fell between primary and secondary school. This reflected a drop in reported levels of relational, as opposed to physical, bullying. There was a non-significant trend (Cohen's $d=0.33, p=0.105$) for a similar drop in peer victimisation in

Table 3. Adaptive function before and after the school transition.

	Time 1 – end of primary school		Time 2 – start of secondary school		Cohen's <i>D</i>	Significance of t-test	Pearson correlation	Significance of McNemar's test
	Mean (<i>SD</i>)	% in clinical range	Mean (<i>SD</i>)	% in clinical range				
Parent report (<i>N</i> =26) ^a								
Vineland Adaptive Behaviour Scale								
Communication	77.96 (11.49)	77.8%	77.73 (12.57)	77.8%	-0.01	0.942	0.12	1
Daily living	78.77 (16.08)	74.1%	79.88 (12.53)	74.1%	0.14	0.524	0.84***	1
Socialisation	75.27 (13.12)	70.4%	69.77 (14.60)	85.2%	-0.39	0.062	0.47*	0.219
Adaptive behaviour composite	75.62 (10.71)	85.2%	73.81 (10.30)	85.2%	-0.20	0.332	0.61**	1
Teacher report (<i>N</i> =20)								
Vineland Adaptive Behaviour Scale								
Communication	85.79 (9.27)	45.0%	74.74 (15.69)	80.0%	0.73	0.005	0.36	0.016
Daily living	85.40 (13.85)	55.0%	77.35 (15.32)	70.0%	0.44	0.068	0.19	0.453
Socialisation	77.90 (9.25)	80.0%	73.50 (11.81)	80.0%	0.39	0.107	0.41	1
Adaptive behaviour composite	81.85 (9.75)	65.0%	73.70 (11.72)	85.0%	0.75	0.004	0.47*	0.219

SD: standard deviation.

^aTwo parents did not provide data on adaptive function at follow-up.

p* < 0.05, *p* < 0.01 and ****p* < 0.001

Table 4. Peer victimisation before and after the school transition.

	Time 1 – end of primary school		Time 2 – start of secondary school		Cohen's <i>D</i>	Significance of t-test	Pearson correlation
	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)			
Schwartz Peer Victimization Scale							
Parent-reported victim of bullying (<i>N</i> =27) ^a	4.99 (4.49)	–	2.44 (2.43)	–	0.59	0.008	0.21
Child-reported victim of bullying (<i>N</i> =26) ^b	4.30 (3.80)	–	2.77 (2.86)	–	-0.33	0.105	0.05

SD: standard deviation.

^aOne parent did not provide follow-up data.

^bTwo children did not provide follow-up data.

the self-report data. Unlike the psychopathology and adaptation constructs measured, peer victimisation showed no continuity during the transition: Knowing who was bullied at primary school revealed nothing about who would be bullied at secondary school. One possible explanation is that school environment, rather than individual characteristics, is the key influence on a child with ASD's risk of being bullied at school. Such a notion is compatible with evidence from non-ASD samples that schools vary significantly in terms of how much their pupils are bullied (O'Connell et al., 1999)

and that changes in school attitudes and practice can substantially reduce peer victimisation (Ttofi and Farrington, 2009). We speculate that our finding of a reduction of peer victimisation could reflect proactive and successful strategies adopted by the secondary schools in this study. This possibility should be specifically investigated, as knowledge about any ecological processes that reduce bullying of people with ASD would be valuable for informing good educational practice. A more pessimistic interpretation of the apparent drop in bullying is that our post-transition

assessment, in the second term of secondary school, occurred before patterns of peer victimisation could become established. It will be useful in future to study children with ASD throughout their school careers, to understand fully trajectories of peer victimisation.

While no widespread increase in problems was observed, our findings do raise several concerns for children with ASD making the transition between mainstream primary and secondary school. First, it is possible that there is some escalation of difficulties that is most observable in the school context. By school report, adaptive behaviour in general, and communication in particular, was lower at secondary compared to primary school.

A second concern is that we observed high levels of psychopathology and adaptive function difficulties in this sample. As such our participants have substantial support needs. We made a number of observations to suggest that these needs are under-recognised and often go unmet. First, all participants in our study have been labelled with 'high-functioning' ASD, despite the fact that 85% scored in the low range for adaptive function on the parent VABS-II. Second, only 40% of the children in this study received additional state funding to meet their special educational needs in mainstream education. Third, we identified at least two cases of undiagnosed intellectual disability among these pupils attending mainstream school. Fourth, despite high rates of parent- and teacher-reported psychopathology, only half of the participants had an official diagnosis of a co-occurring mental condition.

A further concern is that the high levels of psychopathology and low adaptive function we observed tended to persist during the transition period. This trajectory fits with the observations of Chung et al. (1998) who, using cluster analysis of data from typically developing children, identified a high-risk subgroup who showed high levels of distress before, during and after the move from primary to secondary education.

The following limitations should be considered. First, the generalisability of our findings is inevitably limited by the sampling strategy used and the fact that the study is concerned with an ecological shift. The transition we described occurred in the UK state school system: It is likely to have distinct characteristics and outcomes compared to equivalent transitions in private schools and in other countries. Second, this study describes children undergoing school transition, but did not directly investigate social and educational processes that occur during this time which might influence outcomes. Investigation of risk and protective effects that influence interactions between the individual and the environment during school transition is required, to shed light on the school difficulties faced by people with ASD and to suggest means of support. Such work is likely to require a mixed methodology approach with inductive, qualitative techniques being used to general hypotheses about the

process of transition for subsequent deductive, quantitative investigation (Barker and Pistrang, 2005). Third, we were not able to collect full longitudinal data on all 28 children in the study. In particular, it was not possible to attain baseline and follow-up teacher data for eight participants. Such missing data reduced the power of some of our analyses and may impact on generalisability. Finally, the lack of a control group limits the inferences that can be sustained by the data. In particular, we cannot be sure to what extent our observations during the school transition are specific to people with ASD. This could be clarified by the use of non-ASD controls, including individuals with different developmental disorders.

In conclusion, this initial investigation of change and continuity during the transition of children with ASD between primary and secondary school has implications for clinical practice, educational policy and research. Clinicians and educators working with children with ASD during the school transition should be aware that even children labelled as having 'high-functioning' ASD are likely to have significant support needs and that these extend well beyond their core autistic difficulties, to include impaired adaptive function and co-occurring psychopathology. Nevertheless, while many children and parents approaching the school transition do so with a sense of dread (Tobin et al., 2012), our findings give cause for some cautious optimism. In particular, the commonly held notion that a move to secondary school will inevitably lead to higher risk of peer victimisation is not supported by our data. Research is required to elucidate which processes promote successful school transition for people with ASD, so that they can be harnessed to guide manualised interventions.

Declaration of conflicting interests

Drs Mandy, Murin, Baykaner, Staunton, Hellriegel, Anderson and Skuse report no relevant financial interests or potential conflicts of interest.

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