

Guidance on being educated out-with the peer group including deferred and early entry to school

Appendix 1

Research on the impact of education out with the peer group

Executive Summary

Deferred Entry:

- Deferral characteristics vary, with choices made primarily around birthdate and maturation effects. There is some concern over the delayed identification of needs and the influences parents may have in choosing to defer, with advice often sought from fellow parents and professionals out with education.
- Negative effects can be observed in the long term when children are placed substantially out with their chronological year group.

Retention:

- Retention at worst results in small negative effects on achievement, but this depends on the method of analysis employed. Alternatively, there is either no effect which justifies the practice.
- Social, emotional and behavioural outcomes may vary over time; with an initial boost to begin with. But these effects do not last over time and indicate serious concerns in long term outcomes.

Early Entry:

- Academic performance relative to age varies, and comparisons to older age peers tend to show delay within younger entry students. This is dependent on the method of analysis, where age standard scores often show no deficit.
- Whilst social and emotional outcomes may not necessarily vary massively, there is scope to seriously consider the long term outcomes with further research as well as with the concerns over the possibility of bullying in the younger children.

Research Findings

Deferred Entry: the decision has been made, by reason of birthdate or another reason, that enrolment into the oncoming academic year is postponed until the following year. This will result in the child being older than their class level peers.

In examining the prevalence and characteristics of children who were more likely to defer, Graue (2000) reported that males were more likely to wait a year; whereas girls are likely to enter school early. Even for deferred entry males, they are still more likely to be retained in a later part of their school lifetime and to be referred to specialist services for additional needs. Those born just before summer, and would eventually be the youngest in their class that

year, are likely to wait to enter school and subsequently more likely to be retained later in their school career. Those eligible for a free school meal entitlement are more likely to be retained than deferred at school entry.

Within a Scottish context, the Scottish Government (2012) examined early primary school experiences. 87% of children started school in the August when they became eligible, whilst 13% had entry deferred. Of those children deferring entry, 42% of children were under 5 years of age, 49% were aged between 5.0 – 5.5 years and the minority (9%) were aged older than 5.5. years. Approximately half of children born in January or February deferred entry, with more boys starting school at a later age. The reasons for deferring as reported by parents, related to concerns regarding child being reported as 'not ready' (44%) or that they were too young (32%). 8% reported deferral due to health or developmental reasons and 5% reported that deferral was recommended by the child's nursery or health visitor. 10% did not provide a reason for deferring entry.

Notably, whilst the idea of deferred entry is based on the maturational perspective, which could explain the difference between higher rates of female early entry versus the higher rates of males deferred entry (Graue, 2000), the decision may itself be influenced by community perspectives. As Graue (1993) reported, trends in the community influence parents' decisions and standards to defer children. Parents of children in a younger setting stressed the importance of not pushing children too much, whilst parents of children at early primary level discussed the lack of challenge in early years.

In terms of investigating performance, a study by Jaekel, Strauss, Johnson, Gilmore and Wolke (2015) looked at achievement findings, comparing those who had delayed entry to school and those who entered school aged appropriately. They find that whilst teacher ratings on mathematics, reading and attention do not differ between the groups, standardized achievement on these outcomes are significantly lower for the delayed entry pupils as opposed to the age appropriate entry pupils. However, there is some caution to be applied as by the time this assessment was done, the age appropriate pupils had a greater level of time in education. Whilst the authors have attempted to demonstrate and correct findings based on this and speculate that there would continue to be a significantly lower level of achievement within the delayed entry group, this should be interpreted with caution.

Looking at a variety of outcomes, Martin (2009) examined curvilinear effects of younger and older secondary students. Three groups were stratified. In a 12-month age span, two groups were formed. One group was classed as 'young' if they fell into the lower 3-month band of the 12-month span. The other 'age appropriate' entry group was composed of students whose chronological age fell into the 3-12-month band. The third 'older for cohort' group were those whose chronological age was greater than the 12-month time span. For those older than their age appropriate peers, students were higher in disengagement, lower in positive intentions, homework completion and lower for literacy and numeracy performance. Younger for cohort students were reported as higher in their enjoyment for school, positive intentions, attendance rate, homework completion and higher in literacy and numeracy performance. Such work investigating the curvilinear trends is one of few, as most statistical analyses often consider there to be a linear effect of increased age and decreased performance, but this may not be the case.

In summary, there is evidence to suggest there may be short term academic benefits to deferral. But, there is a risk that whilst it is reported that this is a method to control for developmental immaturity; it could fundamentally be postponing the need for specialist support which would otherwise be identified within chronologically placed education.

The placement of young people who are chronologically older than their peers can impact upon performance negatively through a host of behaviours which revolve around school disengagement. This can lead to a detriment in performance to academic attainment, as well as attendance.

Retention: Where children repeat a year at the same level because of poor academic achievement and/or lower capacities in cognitive, social or emotional skills. This often leads to the 'retainer' being placed amongst those out with their chronological age group, in that the retainer is typically one year older than new class mates.

Several factors are involved in the decision to retain. Davoudzadeh, McTernan and Grimm (2015) report that low academic ability in reading, writing and general knowledge skills were the biggest predictors of repeating a year. Younger entry males with lower motor skill ability as well as lower social and emotional skills were more likely to be retained. Whilst children from ethnic minorities were at a greater risk to be retained, it was dependent on whether English was or was not their primary language at home. The author's attribute this finding to the perception that teachers are likely to perceive any language difficulties within the minority group as a result of a barrier in learning a second language, whereas white individuals with English as a first language are more likely to be perceived as having a specific impairment. Huang (2014) also supports the finding of younger children being more likely to be retained if their approach to learning was significantly low. Huang also reported that children with a smaller height were also more likely to be retained, and this is likely to be associated with maturational viewpoints; as children who are taller are likely to be older and perceived more mature and ready to learn.

Finally, Davoudzadeh et al.(2015) note the school factors which may have an impact. Schools with pupils for whom the majority live in poverty was a big risk factor, as well as a composition with a large ethnic minority population. Schools that had a greater proportion of socially deprived individuals, who were from a minority ethnic groups, were more likely to retain students.

As noted in Docket and Perry (2013), the majority of retention literature cites children with "special needs" as a majority group for retention. One study by Barnett, Clarizio and Payette (1996) investigated the prevalence of retention amongst children with diagnosed learning disabilities (LDs). They find that retention practices often precede referral to specialist services. Individuals with LDs who had been retained were often a year older when referred to specialist services than those with LDs who had not been retained. Children with LDs who had been kept with their age peers, scored significantly higher on standardised measures of written expression and mathematical calculation. Whilst there was a difference in performances across these measures, the decrease in scores within the retained group cannot necessarily be attributed to the fact these children were retained. The findings of Barnett et al. are associational and descriptive of the practice of retention within children with LDs.

The decision to retain has been based on the likes of performance in academic areas, as well as social and emotional development. Such decisions are fundamentally based on teacher assessment judgement. With academic performance being the biggest predictor (Davoudzadeh et al. 2015); some studies have matched and tracked those who are at equal risk of being retained due to lower academic ability. This has led to quasi-experimental designs consisting of one academically low achieving group transitioning as usual to the next level whilst the other, equally as low achieving group, is retained. Across a number of studies, it has been found that there is no significant difference in academic ability at baseline between these at risk groups who were promoted or retained (Bonvin, Bless & Scheupbach, 2008; Ehmke, Dreschel & Cartensen, 2010; Lamote, Pinxten, Noorgate & Damme, 2014). This finding has been replicated at both an early school level and a secondary school level.

Bonvin et al. pointed to factors which play a part in the teacher's perspective and the decision to retain. This was related to whether the teacher had a more positive attitude towards retention, viewed the child as developmentally immature and whether they underrated the child's performance in terms of their academic potential. As their findings indicated, teacher's had lower expectations of academic achievement for those that were going to be retained, as well as those children being more developmentally immature. The suggestion is that there is a significant level of inaccuracy in regards to the judgement of true academic performance, and this may be influenced by the likes of confirmation bias.

Wu, West and Hughes (2008) investigated the rate of growth in maths and reading. This involved children at around 6 years of age. When examining standardised mathematic achievement scores, the overall growth over 3 years was negative. This negative effect seemed to be stronger for those who were retained and did not possess English as a first language. However, the sample size considering English proficiency was relatively small and conclusions cannot be definitively drawn in regards to English as an additional language being a moderator of negative effect. Whilst standardised reading achievement scores showed a smaller growth for the retained individuals in comparison to the promoted, it was not statistically significant. However, the work of Gleason, Kwok and Hughes (2007) evidenced a significant difference in the repeat year, where retainers standardised scores on maths and literacy assessments were significantly lower than their promoted peers.

Work by Vandecandelaere, Vansteelandt, Fraine & Damme (2016) further examined the effects of early retention, but also examined whether prior achievement and age altered the effects. They examined a group at risk of being retained and stratified them by age and prior achievement. For low achieving children who were retained, there was a significantly large effect between them and the equally low achieving children who went through education with their age peers. Initially, performance takes a steep dip at the point of retention and gradually follows the typical trajectory of improved performance. However, there is a continuous gap between matched promoted peers and those who were retained, with retained students falling behind their matched peers. For the higher achieving at risk group, this trend continued but was no longer significant in the medium term. For those who were classified as at risk and younger in age, retention led to significantly lower performance across the short and medium term, whilst for the older group this effect was relatively short

term. As a result of these findings, the authors suggest that continuous promotion would be likely to be a better solution as opposed to grade retention.

In secondary school, the effects of grade retention seem to be much the same in regards to achievement. However, Klapproth et al. (2016) reported that for secondary school students, who were approximately 12 years old; retention predicted a boost in mathematics achievement in comparison to their promoted counterpart's grade performance. But, this advantage disappeared over time where eventually, there was no significant difference in performance in mathematics between the promoters and the retainers. Lamote et al(2014) mirrors a similar trend, with a steep decline in language achievement evidenced four years post retention year. Uysal (2010) estimated that academic outcomes, in particular the likelihood of graduation, ultimately worsened for anyone retained. The strength of that negative effect increased for those who were retained when they were older.

Typically, meta-analyses report medium to large negative effects of retention on academic outcomes (Bright,2011). A considerable portion of previous work has usually resulted in biased outcomes both in terms of deciding between same-age vs same-grade analysis, but also around issues of sample size and controlling for pre-existing effects. Ignorance of these factors by previous meta-analyses has ultimately led to inclusion of poor study designs and biased estimates of effects. Allen,Chen,Wilson & Hughes(2009) attempted to counteract this by analysing the impact of both same-grade vs same-age analysis on academic outcomes whilst also filtering out the studies which were of poor quality. They find that the methodological quality of work significantly impacted the intensity of the effect. When they ran the analysis, there was a significant negative effect of grade retention on academic outcomes when adopting the same-age analysis. There was however no effect whatsoever of retention on academic outcomes when looking at same-grade analysis. In other words, same-grade analysis findings indicated that there was no positive or negative outcome associated with retention and academic achievement. Same age analysis provided evidence of small negative effect, suggesting that retention leads to lower academic achievement.

Academic self-concept is defined as one's perception of academic ability (Villegas, Tomasini & Lagunes, 2013). The promotion of such a concept has been of high interest, as it predicts positive learning outcomes. Whilst Klapproth et al (2016) revealed initial positive effects which favoured the retainees in the short term, the benefits did not last in the medium term. There was no significant difference between promoters and retainers in their reported academic self-concept, school anxiety levels, student satisfaction with school or interest in learning. Notably, in Lamote et al. (2014), academic self-concept was found to be significantly greater within the retainees' year of retention in contrast to the promoters. Over the medium term, this increase in academic self-concept within the retainees dropped and remained at the same level as the promoters' self-concept. This short term boost in academic self-concept has been replicated in a secondary sample in Ehmke et al(2010). Cadiex (2003) report a similar finding amongst young, equally low achieving students who were either promoted or retained. In that, there was no significant difference in their academic self-concept over a short time period. However, Cadiex (2003) between subjects design consists of a relatively small sample, which means the results should be interpreted with caution as there may be an effect present but there has been insufficient observations to detect it.

Gleason, Kwok and Hughes (2007) investigated the impact of retention and peer relations during the year of retention. Those who were retained were accepted more by class peers than the promoted children. This was mediated by peer and teacher rated academic competence, in that the more competent academically the retainers were perceived the more accepted they were by their peers. However, this peer acceptance seems to be only applicable to the first year of retention, as peer liking of retainees seems to decrease significantly in the long term (Wu, West & Hughes, 2010). In addition to this, Wu et al., note that retained children report higher academic self-efficacy overtime in comparison to their promoted counterparts. Sense of school belonging was also higher in the short term, but failed to maintain itself in the long run.

Mathys, Veronneau and Lecocq (2017) examined retention and psychosocial adjustment for secondary school pupils. Their findings show that retained students show significant decreases in student self-esteem and perceived a significant lack of support from their parents which is either helpful or lacks meaningful involvement. The findings also indicate a lack of intrinsic and extrinsic motivation, as well as social withdrawal.

Gleason et al., (2007) report finding a greater sense of peer acceptance amongst younger children who were retained; but they were also rated as less engaged in their school setting. Contrary to this, Wu et al (2010) indicate that teacher rated engagement was higher on the short term, yet did not differ from the promoted children in the long term. In addition, teacher rated hyperactivity was rated lower in the short and medium term, as well as peer rated withdrawal.

There may be an issue in sustainability of an effect in terms of retention. Or, for some outcome measures assessments, there was a bias in the assessment of engagement. It may be the case that the teachers who suggested retention may be re-assessing the child within the short term time period and selecting items which support teacher's decision and views of retention. By the time the child has progressed into a new classroom and entered the medium term assessments, the retained children have been assessed by a new teacher, independent of the retention decision.

For those in secondary education, as investigated by Mathys et al (2017), there were negative features of behaviour because of retention. There was a greater frequency of aggressive and delinquent behaviours amongst those who were retained. In addition to this, Martin (2011) presented a model for secondary school retention and its effects. The model predicted that retention resulted in higher absence rates from school, lower homework completion and was accompanied by the lower levels of academic self-concept and self-esteem.

Overall, the literature has placed most emphasis on tracking outcomes in either primary or secondary settings. There has been a question of further longitudinal work assessing the impact of retention, particularly from an early age right through to secondary school performance. One piece of work which examines exactly that is Jimerson and Ferguson (2007). They studied four groups: one which consisted of promoted (P) children, one which consisted of children suggested for retention but were promoted (RP), another with children who were retained (R) and a final group which was retained but attended a specialist

transition programme (TR). Tracking of these four groups took place from primary entry and followed them through to secondary.

The findings initially suggested that academic achievement showed significantly higher academic performance amongst the P group, whilst the RP, R and TR groups did not differ to begin with. Towards the end of primary education, the group which was suggested to be retained but was promoted (RP) was found to be achieving significantly more academically in comparison to the retained R & TR groups. This continued to be the case throughout secondary education. Notably however, the high school scores should be interpreted with caution, as there were high levels of school dropout from both retained groups. This dropout rate from school for retained students in comparison to promoted counterparts was significantly different. In addition to this, aggression scores amongst retained students were significantly higher than promoted students, including those who were recommended for retention but promoted.

Whilst caution is applied in interpreting the findings of Jimmerson and Ferguson (2007) due to the increased dropout rate leading to relatively small group sizes; similar findings have been replicated. Over a 10 year period in secondary children, Uysal (2010) found that that graduation from secondary education was less likely for retainers in contrast to promoters, and this was particularly prominent for males in contrast to females. Even in Mathys et al (2017), there are similar effects observed. Surprisingly, such effects of aggression related behaviours have not been observed in primary settings when examining the effects of retention.

In summary, two outcomes are likely to exist within the evidence for academic achievement. At worst, there is a small to medium impact of retention, in which it harms academic achievement. Or at best, there is no effect either positive or negative of retention on achievement, which proves difficult to justify the practice. Whilst same-grade comparisons and initial observations may show biased increases in the performance of retainers, it is likely that over time such observed advantages will disappear.

Early Entry: Where entry is earlier than expected, whether by birthdate or another reason, entry into the oncoming academic year is imminent. Children are significantly younger than their class level peers.

Reports published within the Institute of Fiscal Studies (Crawford, Dearden & Greaves, 2013) have synthesised various longitudinal studies and reported on early entry in England, where the academic year typically runs from the 1st of September to 31st of August. Most of local authority policies in England state that all children start school in the September they turn 4 years old. Those children who turn 4 at the end of the academic year are likely to be significantly younger than those who have birthdays at the beginning of the academic year, with the largest age gap being 11 months.

Crawford et al. (2013) indicate that the largest gaps between the youngest for cohort children and age appropriate entry children are strongest in the earlier stages of schooling, with an achievement gap of 26 percentage points between the two at age 7. This gap closes over time, with a gap of 6.5 percentage points at 16 years of age. The magnitude of this gap differs on assessment method, with standardised tests indicating a smaller gap as opposed

to achievement on national curriculum tests. Such a finding leads the authors to question whether this is due to the appropriateness of the curriculum for the younger entry students, or bias in teacher judgement. Notably, these findings regarding the achievement gap have also been found by Fleishman (2007) within early primary, with gaps identified in mathematical and reading performance.

However, there remains the issue of same-age vs same grade analysis (or as the Crawford et al. refer to it: 'same time effects'). If comparisons are made at the same time between age mismatched peers who share a classroom, the findings will bias the older children who are more developed in their approach to learn (Huang, 2014). But when same age analysis is utilised and the test is conducted at a different time where the ages between groups are comparable, there is no difference in performance regarding achievement.

In terms of social and emotional development, Crawford et al. (2013) show that difficulties (as measured by the Strengths and Difficulties questionnaire), are greater for younger entry students in comparison to older peers. This gap continues into late primary according to teacher observations. However, there is no data beyond this point, making it hard to determine true sustainability of the effect. For academic self-perceptions, younger students view themselves as academically incompetent at the ages of 8 and 14. Analysis indicates that the changes in self-perception can be explained considerably by the comparably lower academic performance in earlier stages. This is likely to feed into the fact that these younger students are less likely to consider university education. But for those younger students who do attend university, they tend to achieve more in their university education. Again, the same time effect of assessment applies to the measures of social and emotional development. The differences between older and younger students drop substantially when comparing them via same age methods. However, the difference between perceived academic competence remains. Younger entry students continue to perceive themselves as academically less competent in comparison to peers.

Another item worth noting is that for younger children, there was a greater percentage of reporting a strong dislike of school in comparison to older class mates. Whilst child reporting of bullying to parents was not different between groups, younger children self-reported a greater incidence of being bullied in contrast to older class mates (Crawford et al. 2013). The source of bullying was not reported.

Overall, children who progress to school early and who are significantly younger than their peers are perceived to be less able in a number of domains in regard to academic achievement when compared to their chronologically older peers. Yet, when younger entry students are matched on age, they are on track in terms of their age standardised performance. Comparable development is also evident in some social and emotional domains when comparing age matched levels, but approaches to learning itself is an aspect which tends to be lower for younger children in contrast to their older class peers. Other risks are also present in terms of possible bullying and disengagement from school, which can pose issues in the long run.

Limitations of the evidence

Same Age vs Same Grade (vs Same Time)

Same age analysis typically allows for comparisons between chronological age levels. In cases of retention, same age analysis will show a negative effect of retention as the retained group will be compared to those who have transferred to the next level with their age peers. Typically, the promoted group increases in achievement because they naturally progress to more advanced topics and teaching. In contrast, the same grade approach will show benefits of retention by taking the retainees performance by the end of their repeat year and comparing that with the performance of either i) their current, younger class peers or ii) the previous performance of peers who have been promoted. This biases retainees, as they have essentially studied the same materials again.

Same time analysis also follows this process. Where a chronologically older child and a chronologically younger child start school at the same time, and sit a test at the same time, the findings will likely benefit the older child due to their increased approach to learning as a result of their developmental progress. But compare the performance of the younger child in the future in comparison to the initial performance of the older child; the gap will have closed as the comparison is more age appropriate. This is evidenced in studies where standardised age equivalent performances are used.

UK studies

Very few studies of grade retention are conducted within the United Kingdom. The majority of countries where the practice takes place include the likes of Australia; America; Canada and Central Europe (Germany & Belgium). With these various educational systems, it is difficult to say with absolute certainty that the negative findings of retention on academic, social, emotional and behavioural outcomes apply to a Scottish context. Nonetheless, it is worthwhile noting that a number of outcomes have been consistently replicated across these varied educational systems which encompass various practices.

Control for multiple comparisons

Whilst the quality of studies has certainly improved within the likes of increased sample size, for example, thus improving generalisability; there are a surprising amount of studies which do not control for the Type I inflation rate. It is likely that, with the high number of outcomes tested via Null Hypothesis Significance Testing, there may be a risk of detecting a significant difference where one does not exist at all. This would be ideally controlled through the application of an appropriate statistical correction, but this does not seem to have been applied in the majority of studies. Hence, there is a risk of detecting a false positive.

Even for studies which have many outcomes and a low number of participants, the variation around the mean may be considerable and subsequently lead to inaccurate estimates of effects as a result of this variability; increasing the likelihood of statistical error.

Control for pre-existing differences

Causality is difficult to prove within this design due to the lack of experimental assignment, but the increased use of propensity score matching alongside the statistical control of confounds has allowed for less biased estimates of effect. Whilst recent research has been helpful in utilising this technique, it has proved heterogeneous in the varied use of covariates and the various levels of control between studies. Nonetheless, it has proved to be a considerable boost to the validity of findings in contrast to work completed several years ago.

The risk of longitudinal studies losing external validity over time

Many studies have aimed to establish validity in tracking individuals over the time course, over various periods within the past 20-40 years. This has been extremely useful but there is a risk that the sample studied may be historic and whilst even in a similar setting, may not reflect the educational reforms which currently exist within the current context.

Effects could be non-linear, but are not assessed

Authors tend to pick up within their discussion sections that effects of retention, deferral or early entry may be nonlinear. They may represent a quadratic or a cubic function, as opposed to a straightforward linear association. Yet, there are few studies to assess this directly, making it difficult to ascertain the true extent of linear and non-linear effects and whether they are replicable.

Multi-level effects

Alongside the increased use of propensity score matching, multi-level modelling has been implemented to examine the various levels of effects surrounding the issues described. These may examine effects, for example, at the level of the individual child, the classroom, the school and consist of various measures which will aim to statistically control for confounds and understand their effects at each individual level. Of course, these measures themselves must be valid and reliable, and as it has been discussed there may be inadvertent biases within the reporting of these variables dependent on the method. Nonetheless, even after controlling for a multitude of effects there is the risk of leaving variables unexamined which may ultimately explain the variance in the predicted outcome better than the current variable(s) under investigation.

Appendix 2

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