

AUTHOR QUERIES

- AQ1: Please check the usage of ‘path determinance’.
- AQ2: Please check whether the edits made to the sentence ‘The rate of deferral ...’ are correct.
- AQ3: Please check whether ‘the legal right to choice’ is correct.
- AQ4: Please check Figure 6 to ensure that the colour display is clear when converted to greyscale for the print version.
- AQ5: The following references do not have an in-text citation or cross reference within the text: Dockett, S., & Perry, B. (2003); Drenowatz, C., Ferrari, G., Greier, K., & Hinterkörner, F. (2021); Frey, N. (2005); Royal College of Paediatrics and Child Health. (2012); Scottish Government Statistics. (2020b). Please provide the location where the cross reference has to be inserted or consider deleting the reference from the reference list.
- AQ6: Please provide page range for Dockett, S., & Perry, B. (2003); Jakobsson, J., Julin, A. L., Persson, G., & Malm, C. (2021).
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INTRODUCTION AND PROBLEM CLARIFICATION

1.1. INTRODUCTION: WHAT IS THE RAE?

The RAE is the name given to a range of different effects attributed to one's age relative to an age-banded cohort. While this phenomenon has been extensively studied within sporting contexts, where it leads to preferential selection of the oldest within the cohort (Cobley et al., 2008), its implications extend far beyond the playing field into domains that fundamentally shape life trajectories. The RAE represents a systematic pattern of advantage and disadvantage that emerges when children are grouped by chronological age, creating a situation where those born earlier in the selection period consistently outperform those born later, not because of inherent ability but simply because of their relative maturity at key developmental stages.

The breadth of domains affected by RAE continues to expand as researchers investigate its reach. In mental health, RAE has been identified in anxiety (Broughton et al., 2023), depression (Root et al., 2019), self-esteem (Goodman et al., 2003; Reijneveld et al., 2006; Thompson et al., 2004), and suicide (Thompson et al., 1999; Matsubayashi & Ueda, 2015). The association with suicide is particularly sobering, indicating that RAE may contribute to the most severe mental health outcomes.

In educational and developmental contexts, RAE has been linked to learning disabilities, including ADHD (Fleming et al., 2022; Holland & Sayal, 2019; Synergy for the Influence of the Month of Birth in ADHD (SIMBA) Group et al., 2023). This association raises important questions about diagnostic practices and whether some children are being pathologised for developmental differences that are, in fact, age related and predictable. The implications for children who receive unnecessary diagnoses and potentially unnecessary medical interventions are significant and warrant careful consideration.

Physical health and safety are also affected by RAE. Research has documented associations with physical injuries (Stracciolini et al., 2016), particularly in sporting contexts where younger children may be physically mismatched with older peers. This creates not only immediate injury risk but also potential long-term consequences for physical development and participation in physical activity. Indeed, RAE has been shown to influence sports performance and opportunities (Cobley et al., 2008) and participation in sport and physical activities extending across the lifespan (Malm et al., 2019), suggesting that early disadvantage can set trajectories that persist into adulthood.

The social and interpersonal consequences of RAE are equally concerning. Research has identified effects on popularity (van Aalst & van Tubergen, 2021) and leadership opportunities (Dhuey & Lipscomb, 2008; Kuhn & Weinberger, 2005; Li & Hu, 2022). These findings suggest that relative age influences not only how children are perceived by others but also the opportunities they are given to develop important social and leadership skills. The cumulative effect of these early social disadvantages may contribute to the documented impacts on career opportunities (Du et al., 2012) and lifetime earnings (Solli et al., 2017), demonstrating that RAE can have economic consequences that persist throughout the life course.

1.1.1. The Developmental Context of Age Banding

It is important to note that with growth, each child appears to attain their appropriate height regardless of their age relative to their cohort. The physical differences are temporary and developmental rather than permanent. However, what is of profound concern is that the advantage or disadvantage experienced in childhood, of achieving greater or lesser success by appearing better or worse simply by being relatively older or younger, may lead to path AQ1 determinance and differential health and academic outcomes for the individual through what Hancock et al. (2013) describe as the ‘Matthew’, ‘Pygmalion’, and ‘Galatea’ effects.

1.1.2. Mechanisms of Cumulative Advantage and Disadvantage

The Matthew effect, named after the biblical passage ‘For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath’ (Matthew 25:29), describes how initial advantages accumulate over time while initial disadvantages also

accumulate. In the context of RAE, a child who is relatively older may experience early success in academic or athletic endeavours simply because of their greater maturity. This early success leads to positive reinforcement, increased confidence, more opportunities for advanced instruction or competition, and greater investment of time and resources in developing their abilities. Meanwhile, the relatively younger child may experience early struggles, receive less positive reinforcement, have fewer opportunities for advancement, and may disengage from activities where they consistently underperform relative to their older peers.

The Pygmalion effect, also known as the Rosenthal effect, describes how educator expectations and interactions can reinforce success or failure. Teachers and coaches who observe that relatively older children perform better may unconsciously develop higher expectations for these children and lower expectations for relatively younger children. These expectations can become self-fulfilling prophecies as educators provide more attention, encouragement, and opportunities to children they believe have greater potential, while providing less support to children they perceive as less capable. The tragedy is that these differential expectations and treatments are based not on actual ability but on relative maturity.

The Galatea effect describes how self-belief drives individuals to greater or lesser attainment. Children who experience early success develop confidence in their abilities and come to see themselves as capable and competent. This positive self-concept motivates them to persist in the face of challenges, to seek out opportunities for growth, and to set ambitious goals for themselves. Conversely, children who experience early struggles may develop negative self-concepts, seeing themselves as less capable than their peers. This negative self-belief can lead to reduced effort, avoidance of challenges, and lower aspirations. The concern is that these self-concepts, formed in early primary school based largely on relative age rather than actual ability, may set life-course trajectories that persist long after the initial developmental differences have disappeared.

Together, these three effects create a powerful mechanism through which temporary developmental differences can be transformed into lasting disparities in outcomes. The relatively older child benefits from a virtuous cycle of success, positive reinforcement, high expectations, and strong self-belief, while the relatively younger child may become trapped in a vicious cycle of struggle, negative reinforcement, low expectations, and weak self-belief. The implications of these mechanisms for educational equity and child wellbeing are profound and demand serious attention from policymakers and practitioners.

1.2. PUBLIC HEALTH IMPORTANCE: WHY RAE MATTERS

The RAE is fundamentally a public health concern because most people worldwide are subjected to age cohorting and are thereby arbitrarily placed at relative advantage or disadvantage. The scale of this issue is staggering. Globally, more than 1.3 billion children attended school in 2020 (World Bank, 2019), and this number continues to grow. In Scotland specifically, everyone must attend school by law, and there were over 700,000 children in school in 2023 (Scottish Government, 2023). This makes RAE a problem that theoretically affects everyone at some point in their life, though its impacts are distributed unequally across the population.

1.2.1. RAE as a Social Determinant of Health

From a public health perspective, RAE can be understood as a social determinant of health, a condition in which people are born, grow, live, work, and age that shapes health outcomes. The socio-ecological model of health recognises that individual health is influenced by multiple levels of factors, from individual characteristics to interpersonal relationships, institutional practices, community contexts, and societal policies. RAE operates across all these levels. At the individual level, it affects developmental trajectories and self-concept. At the interpersonal level, it influences relationships with peers, teachers, and coaches. At the institutional level, it is embedded in the policies and practices of schools and sports organisations. At the societal level, it reflects broader decisions about how we organise childhood and education.

The health impacts of RAE are both direct and indirect. Direct health impacts include the documented associations with mental health problems such as anxiety, depression, and suicidal behaviour, as well as physical injuries resulting from developmental mismatches in sporting contexts. Indirect health impacts operate through pathways such as academic attainment, which is itself a powerful determinant of health across the life course (Zajacova & Lawrence, 2018), and physical activity participation, which has well-established benefits for physical and mental health (Jakobsson et al., 2021). The association with lifetime earnings (Solli et al., 2017) is also relevant from a health perspective, as income is a fundamental determinant of health, affecting access to resources, exposure to stressors, and health behaviours (Smith, 1999).

1.2.2. Strength of Evidence Across Domains

Across domains, the direction of RAE effects is consistent: relative youth is disadvantageous. Table 1 summarises the strength of evidence.

The consistency of these findings across diverse domains and populations is striking. While the magnitude of effects varies, and while some studies find stronger effects than others, the overall pattern is clear and consistent. Being relatively younger in an age-banded cohort is associated with a wide range of disadvantages that span health, education, social development, and economic outcomes. The socio-ecological model illustrates how RAEs operate at individual, interpersonal, community, and policy levels (Fig. 1).

1.2.3. Scotland’s Unique Problem: Extended Cohorts

The magnitude of RAEs in a given setting is determined by the difference between individuals within the cohort and the absolute age of the individuals.

Table 1. Summary of Strength of RAE Across Domains.

Domain	Strength of Evidence	Direction of Effect	Key References
Mental health (anxiety, depression)	Moderate to strong	Younger = higher risk	Broughton et al. (2023); Root et al. (2019); Goodman et al. (2003)
ADHD diagnosis	Strong	Younger = higher diagnosis rate	Holland and Sayal (2019); Fleming et al. (2022); SIMBA Group et al. (2023)
Physical injury	Moderate	Younger = higher injury risk	Stracciolini et al. (2016)
Academic attainment	Strong	Younger = lower attainment	Sharp et al. (2009); Herbst and Strawinski (2016); Doyle et al. (2017)
Academic streaming	Strong	Younger = lower streams	Schneeweis and Zweimüller (2014); Oterhals et al. (2023)
Sports performance	Very strong	Younger = lower performance	Cobley et al. (2008)
Leadership opportunities	Moderate	Younger = fewer opportunities	Dhuey and Lipscomb (2008); Li and Hu (2022)
Career outcomes	Moderate	Younger = poorer outcomes	Du et al. (2012)
Lifetime earnings	Moderate to strong	Younger = lower earnings	Solli et al. (2017)

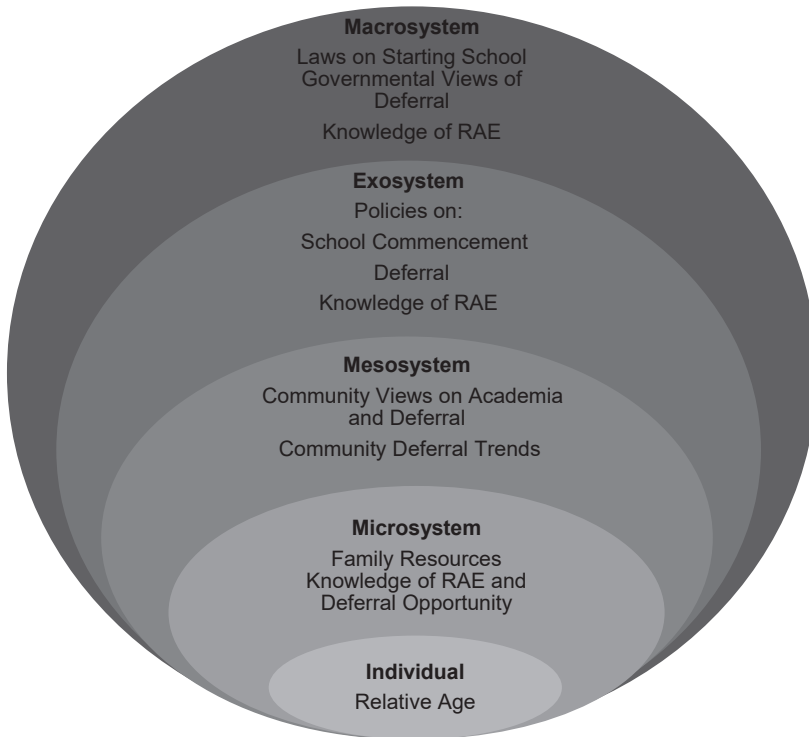


Fig. 1. Relative Age as a Determinant of Health in the Socio-ecological Model.

Source: Developed from Bronfenbrenner (1979).

An extended cohort study (Hanly et al., 2019) showed that each month of age gave better academic and developmental outcomes. It can, therefore, be expected that other effects both beneficial and detrimental will be enhanced in extended cohorts. Intuitively and by combining these findings with those of long-term effects on physical activity (or attainment) (Malm et al., 2019) and educational attainment on health (Mavilidi et al., 2022), it can also be expected that the greater the effect, the longer direct effects will persist and the greater the influence on health across the lifespan. However, the possibility also exists that extended cohorts may create narrower spreads if those selected or selecting to defer are those with both the smallest stature and lowest ability. This is assessed as unlikely in the Scottish context of default customary commencement and parental choice to defer.

1.2.4. Population-level Impact and Equity Concerns

RAE disproportionately harms already-disadvantaged groups: girls, children from deprived communities, and ethnic minorities are more likely to experience negative consequences of relative youth and less likely to benefit from mitigation strategies such as deferral. RAE therefore amplifies existing social inequalities, making it an equity and social justice issue as much as a public health one.

The demographic patterns of deferral in Scotland are particularly revealing. Deferral – the practice of delaying school entry by one year – is taken up disproportionately by white, wealthy families with boys. This means that children from these already-advantaged groups are more likely to become the oldest members of extended cohorts, while children from disadvantaged backgrounds are more likely to be among the youngest. The result is a system that systematically advantages the already-advantaged groups and disadvantages the already-disadvantaged groups, contrary to principles of educational equity and social justice.

1.2.5. RAE as a Safeguarding Issue

RAE constitutes a safeguarding issue. Physical mismatch in extended cohorts creates clear injury risks in sporting contexts: a child aged four years six months participating alongside a child six years old faces opponents who are substantially larger, stronger, faster, and more coordinated, creating conditions where the younger children are at increased risk of both acute injuries and overuse injuries as they struggle to keep up with developmentally inappropriate demands.

The mental health harms documented in the research literature also raise safeguarding concerns. If the school cohorting system is contributing to increased rates of physical injury as well as anxiety, depression, and suicidal behaviour among relatively younger children, then there is an argument that the system is failing in its duty to protect children from harm. While these harms may be unintentional and systemic rather than the result of individual actions, they are nonetheless real and potentially preventable through policy changes.

The association between RAE and ADHD diagnosis is particularly troubling from a safeguarding perspective. If children are being diagnosed with ADHD and potentially medicated based on behaviours that are actually age-appropriate for their developmental stage but appear problematic only because they are being compared to older peers, then the system is causing

harm through unnecessary medicalisation. The evidence suggests that this is indeed occurring, with children born in the months immediately before school entry cut-offs having significantly higher rates of ADHD diagnosis than children born in the months immediately after cut-offs (Fleming et al., 2022; Holland & Sayal, 2019).

1.2.6. The Imperative for Action

Population-level impact, documented harms across multiple domains, exacerbation of existing inequalities, and safeguarding concerns together create a compelling case for policy action on RAE in Scotland. This is a systemic problem affecting hundreds of thousands of children, with life-course consequences distributed in ways that amplify social inequalities.

The fact that Scotland's extended cohort system appears to have evolved without deliberate decision-making or consideration of evidence makes the case for action even stronger. If these extended cohorts were the result of careful analysis that concluded the benefits outweighed the harms, there might be grounds for maintaining the status quo. However, the evidence suggests that the current system has emerged through a combination of historical accident, administrative convenience, and prioritisation of individual choice, without adequate consideration of the collective consequences. This represents a failure of evidence-based policymaking that demands correction.

1.3. STUDY CONTEXT: THE SCOTTISH EDUCATIONAL SYSTEM

To understand how Scotland has come to have extended school cohorts and why addressing this problem is both urgent and complex, it is necessary to understand the distinctive features of the Scottish educational system and how they interact with policies around school commencement.

1.3.1. The Scottish Educational System

Education policy in the United Kingdom is a devolved matter, with Scotland maintaining its own educational system distinct from those of England, Wales, and Northern Ireland, with its own legislation, curriculum, qualifications, and governance structures.

The legal framework for school commencement is established by the Education (Scotland) Act (1980). Under this Act, the legal commencement age is

the August after a child turns five years old, establishing August as the natural cut-off point for school cohorts and creating the expectation of 12-month cohorts spanning from August to July.

However, the 1980 Act also includes a provision for early commencement. Specifically, it states that a child may start school in the August after turning four, rather than waiting until the August after turning five, if the child will turn five before a latest reasonable date. This provision was presumably intended to provide flexibility for families and to allow children who were deemed ready for school to start earlier. However, the Act provides no detailed guidance on how this provision should be implemented, no criteria for determining which children should take up early entry, and no consideration of the collective consequences if large numbers of children were to commence early. Notably, the latest date for turning five has never been legally defined, and it is only by custom that it is generally accepted as by the end of February.

What has happened in practice is that this provision for early commencement has become the assumed default through a likely combination of desire to access state-funded childcare in the years prior to funded childcare places and then maintained through administrative custom. Rather than being treated as an option for exceptional cases, early commencement has become the norm for children born between August and February. Local authorities have established administrative systems that assume children born in this period will start school at age 4, and parents must actively opt out of this assumption if they wish their child to start at the legal commencement age of five. This inversion of the legal framework – where the exception has become the rule – is central to understanding how extended cohorts have emerged in Scotland.

The Scottish curriculum framework, Curriculum for Excellence (CfE), was introduced in 2010 and represents a significant departure from previous curriculum models. CfE emphasises play-based learning in the early years, with more formalised education beginning in primary 2 (the second year of primary school). This approach recognises that young children learn best through play and that formal academic instruction should be delayed until children are developmentally ready. The emphasis on play-based learning in the early years is consistent with international evidence on early childhood education and represents best practice in this area.

However, there is a tension between the play-based philosophy of CfE and the practice of starting children in school at age 4. If the curriculum recognises that young children need play-based learning rather than formal instruction, this raises questions about whether children need to be in school at age 4 at all, or whether they might be better served by remaining in early childhood education settings for an additional year. This tension has not been adequately addressed in policy discussions.

The Getting It Right for Every Child (GIRFEC) framework provides an overarching approach to supporting children's wellbeing in Scotland. GIRFEC is based on the principle that children's needs should be at the centre of decision-making and that all agencies working with children should collaborate to promote their wellbeing. The framework identifies eight wellbeing indicators: Safe, Healthy, Achieving, Nurtured, Active, Respected, Responsible, and Included. These indicators provide a holistic view of child wellbeing that extends beyond academic attainment (Lynch, 2019, 2024) to encompass physical health, mental health, social development, and participation.

The GIRFEC framework is relevant to the RAE issue because it provides a lens through which to evaluate the current school commencement system. If the system is contributing to mental health problems, academic struggles, social difficulties, and reduced participation in physical activity among relatively younger children, then it is failing to promote wellbeing across multiple GIRFEC indicators. A holistic approach to child health and wellbeing, integrating physical activity, education, and community partnerships, is essential for addressing systemic health inequities (Lynch, 2019). The framework's emphasis on putting children's needs first also raises questions about a system that appears to have evolved based on administrative convenience and parental choice rather than evidence about what is best for children's development and wellbeing. Global and holistic approaches to child health recognise that physical education and wellbeing are inseparable components of a child's overall development (Lynch, 2019, 2024).

1.3.2. The 'School Readiness' Debate

The concept of 'school readiness' has become central to debates about school commencement in Scotland, yet it is a contested and poorly defined concept. School readiness is typically used to refer to the developmental capacities that children need to succeed in school, encompassing domains such as physical health and motor development, social and emotional development, approaches to learning, language and literacy development, and cognitive development and general knowledge.

1.3.3. Customary Cut-off Complications

Under the customary system, children born August–February start school in the August after turning four (ages 4 years 6 months–4 years 11 months),

while those born March–July start in the August after turning five (ages 5 years 1 month–5 years 5 months), creating a standard 12-month cohort. However, the deferral provision allows August–February children to delay one year, joining the March–July cohort of the following year. This creates extended cohorts spanning up to 19 months.

The complexity of this system creates several problems. First, it is confusing for parents, who may not understand the distinction between the legal commencement age and the customary practice or the implications of choosing to defer. Second, it creates inequities, as the option to defer has only been a choice for children born in certain months, not to all children. Third, it results in extended cohorts that amplify RAE beyond what would occur in a standard 12-month cohort system.

It is important to note that August- to February-born children are not starting school ‘early’ in any extant legal sense: they are starting early but in line with a provision within the Act at the age adopted by the locality. Hence, the ‘deferred entry’ framing is misleading and contributes to the perception that these children are being pushed in before they are ready and that only those that are ‘not ready’ are choosing to defer.

1.3.4. Commencement Age Discrepancy

The discrepancy between the legal commencement age (August after turning five) and the customary commencement age (August after turning four for children born before March) creates multiple problems that extend beyond the immediate issue of extended cohorts.

First, starting school at age 4.5 is internationally unusual. Most countries have school starting ages of 5, 6, or 7, with 6 being the most common globally. Scotland’s practice of routinely starting children at age 4 places it as an outlier internationally, more similar to Northern Ireland and some parts of England than to most other developed countries. This raises questions about whether Scotland’s approach is based on evidence about optimal starting ages or is simply a historical artefact that has not been critically examined.

Second, the early starting age itself creates the school readiness problem: children starting at age 4 are unsurprisingly ‘not ready’; this is a feature of the early starting age combined with the unusually long cohort, not of individual children. Third, the discrepancy complicates international comparison and family mobility: a Scottish child who started at age 4 may appear behind a child from a country with a later starting age, not due to any difference in ability while transitioning to or from most Northern Hemisphere countries

becomes unduly complex when presented with an apparent six-month stagger, making it appear that a choice must be made between ‘going up’ a year or ‘being held back’ a year when in law no such stagger truly exists. Fourth, starting school at age 4 creates pressure for visible, measurable ‘learning’ that can undermine the play-based approach mandated by CfE, contributing to a push-down of formal academic expectations into the early years.

1.4. DEFERRAL AND ‘REDSHIRTING’ IN SCOTLAND

Deferral is the practice of choosing to delay school entry by one year beyond the expected or customary starting age. In Scotland, deferral specifically refers to the choice by parents of children born between August and February to have their child start school at age 5 (the legal commencement age) rather than at age 4 (the customary age under the early entry provision). The term ‘redshirting’ is sometimes used to describe this practice, borrowed from American terminology.

1.4.1. Origins and Evolution of Redshirting

The term ‘redshirting’ originated in collegiate sports in the United States in 1937, where it refers to the practice of having a student-athlete delay their participation in competitive sports for one year while retaining their eligibility for four years of competition. The term comes from the red jerseys of the University of Nebraska, where the first student-athlete requested to train with the team but not play in games to allow time to physically develop. He wore the red jersey but without a number. In the educational context, ‘redshirting’ has come to refer to the practice of delaying kindergarten entry or repeating a year of kindergarten before starting school, typically for children who are age eligible but whose parents believe they would benefit from an additional year of maturity before starting school.

In Scotland, the practice of deferral has a complex history. Initially, deferral was taken up primarily by white, wealthy parents of boys. This demographic pattern is consistent with international research on kindergarten redshirting, which consistently finds that the practice is more common among advantaged families (Bassok & Reardon, 2013). The reasons for this demographic pattern are multifaceted but likely include greater awareness of RAE research among educated parents, greater resources to afford an additional year of childcare, and greater concern about competitive advantage in the playground, sports, education, and later life.

The justification offered for deferral has typically centred on concerns about 'school readiness'. Parents who defer often express concerns that their child is not mature enough, not socially ready, or not academically ready for school. However, it is notable that when conducted in the United States by similar demographic groups and referred to as redshirting, it is widely accepted as being done with the intent of gaining an advantage.

Subsequent lobbying efforts focused on expanding access to deferral and securing government funding for the additional year of childcare. These lobbying efforts presented RAE research as evidence supporting deferral, arguing that children who are relatively younger in their cohort experience disadvantages and that deferral would protect children from these disadvantages. However, this represents a misunderstanding or misapplication of RAE research. RAE research demonstrates that being relatively younger in a cohort is disadvantageous, but it does not follow that the solution is to allow some children to defer. In fact, deferral exacerbates RAE by creating extended cohorts with even larger age ranges, thereby increasing the disadvantage experienced by the youngest members of the cohort who do not defer.

1.4.2. Policy Changes and Funding Decisions

A critical turning point in the evolution of deferral in Scotland came in 2014, when the Scottish Government introduced automatic entitlement to government funding for an additional year of childcare for children born in January and February. Prior to this change, parents who wished to defer had to fund the additional year of childcare themselves, which created a significant financial barrier for many families. The 2014 change removed this barrier for children born in January and February, making deferral a realistic option for families who could not previously afford it.

The rationale for this policy change was framed in terms of equity and school readiness. The argument was that children born in January and February were the youngest in their cohort and therefore most likely to struggle with school readiness, and that all families should have the option to defer regardless of their financial circumstances. However, the policy change was not accompanied by any requirement or expectation that children born in these months should defer, nor was it accompanied by efforts to improve school readiness of settings to better accommodate younger children. Instead, it simply removed the financial barrier to deferral while leaving the decision to individual families.

The effects of this policy change were predictable. Deferral rates for children born in January and February increased substantially following the

introduction of funded deferral (Fig. 2). However, the demographic patterns of deferral persisted, with white, wealthy families still more likely to defer than families from ethnic minority backgrounds or deprived areas. This suggests that financial barriers were not the only factor influencing deferral decisions, and that cultural factors, information access, and attitudes towards education also play important roles.

The last official figures were published for 2018, showing an increasing trend, especially among January- to February-born children, since 2014, when government funding was introduced. The rate of deferral is higher the closer to the cut-off and among boys (Fig. 3), white ethnicities (Fig. 4), and higher socio-economic statuses (SEs) using the Scottish Index of Multiple Deprivation

AQ2 (SIMD) (Fig. 5).

These rates exceed those for the rest of the United Kingdom of around 1.5% (Fleming et al. 2022) or those in the area studied in the United States (Cameron & Wilson, 1990; Dhuey et al., 2019). While the trend for SES, sex, and ethnicity also matches those seen internationally (Greenburg & Winsler, 2020; Hanly et al., 2019; Huang, 2015).

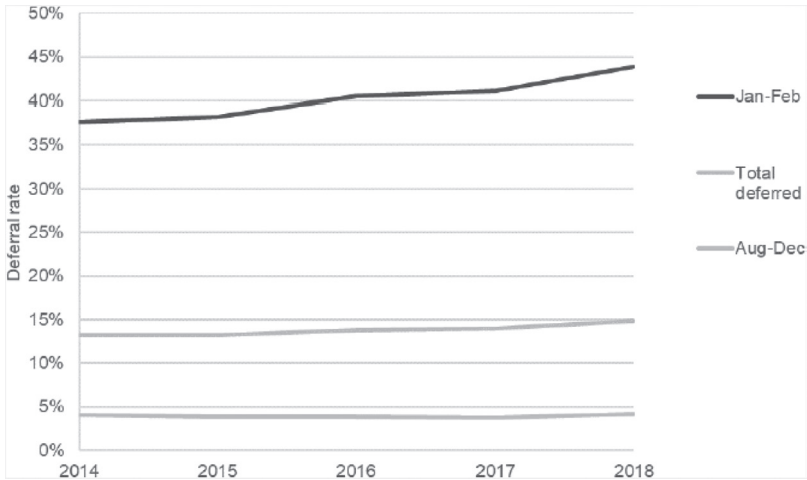


Fig. 2. Deferral Rate Total and by Birth Months January–February and December–August 2014–2018.

Source: Scottish Government Statistics (2020a).
Note: Shows overall deferral rates and differential rates by birth month, demonstrating higher deferral among January- to February-born children.

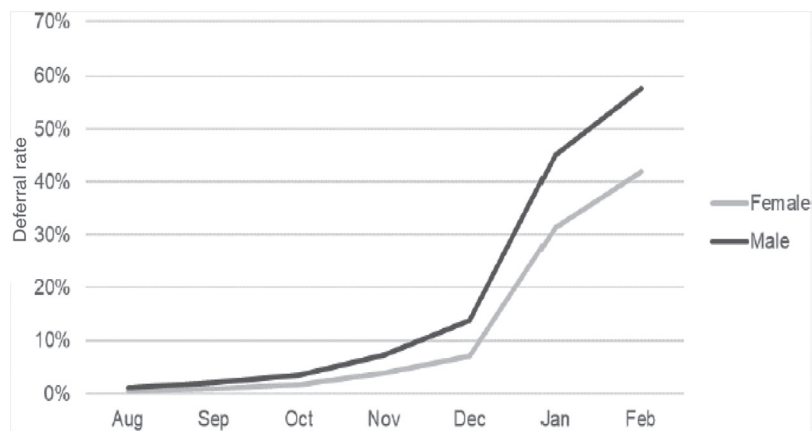


Fig. 3. Deferral Rate by Sex and Month of Birth 2018.

Source: Scottish Government Statistics (2020a).

Note: Demonstrates higher deferral rates among male children across all birth months.

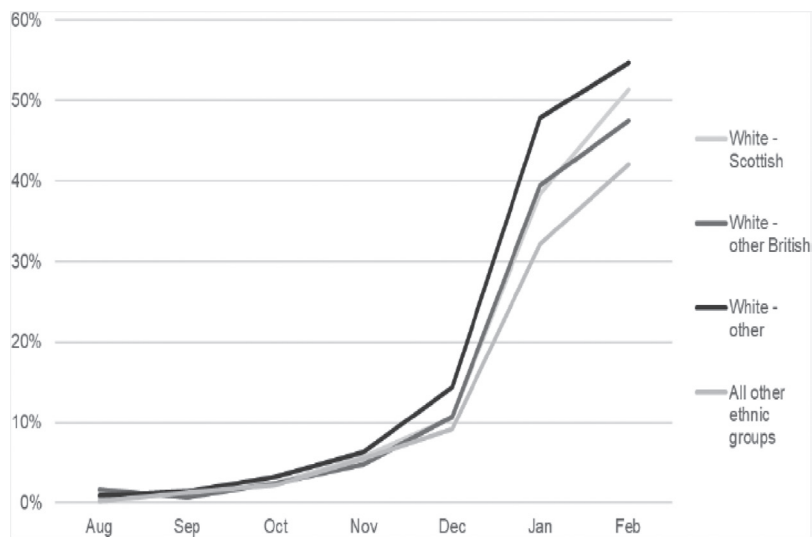


Fig. 4. Deferral Rate by Selected Ethnicity and Month of Birth 2018.

Source: Scottish Government Statistics (2020a).

Note: Shows differential deferral rates by ethnicity, with higher rates among white children.

1.4.3. Demographic Patterns and Inequities

By SES, children from the least deprived areas (as measured by the SIMD) are substantially more likely to be deferred than children from the most deprived

areas (Fig. 5). This pattern is particularly pronounced for children born in the autumn months, where deferral rates in the least deprived areas can be three or four times higher than in the most deprived areas. Even with the removal of financial barriers through funded deferral, this socio-economic gradient persists, indicating that factors beyond cost influence deferral decisions.

By local authority, there is substantial variation in deferral rates, even after accounting for demographic differences. Some local authorities have much higher deferral rates than others, suggesting that local policies, practices, and cultures influence deferral decisions. Some local authorities have actively promoted deferral as an option for parents, while others have been more neutral or have even discouraged deferral. This variation creates a postcode lottery where children’s educational experiences depend partly on where they live.

These demographic patterns mean that deferral is functioning as a mechanism that amplifies existing inequalities rather than reducing them. Children from already-advantaged groups (white, wealthy, male) are more likely to defer and thereby become the oldest members of extended cohorts, gaining the benefits of relative age advantage. Meanwhile, children from already-disadvantaged groups (ethnic minorities, deprived areas, female) are more likely to be among the youngest members of extended cohorts, experiencing

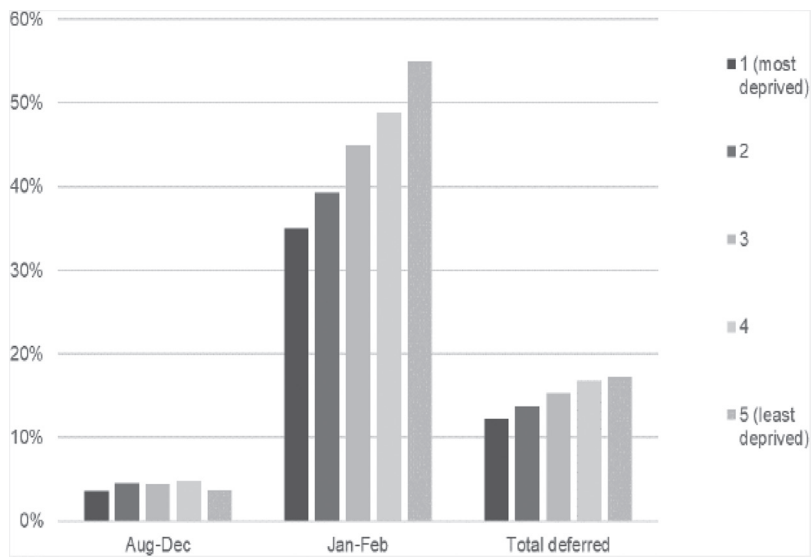


Fig. 5. Deferral Rate by SES Using SIMD Quintile and Birth Months January–February and December–August 2018.

Source: Scottish Government Statistics (2020a).
Note: Demonstrates inverse relationship between deprivation and deferral uptake.

the disadvantages of relative age disadvantage. This is the opposite of what an equitable education system should do.

1.4.4. Pilot Schemes and Alternative Approaches

In response to growing concerns about extended cohorts and deferral inequities, some Scottish local authorities have piloted alternative approaches to school commencement. These pilot schemes have typically involved promoting deferral – to start the August after turning five, rather than the customary early entry age (August after turning four for children born before March) (Fig. 6).

The pilot schemes have demonstrated that it is feasible to implement a later starting age without requiring additional resources. Concerns that schools would not have sufficient capacity to accommodate larger cohorts if fewer children deferred have not materialised in practice. The pilots have also shown that parents can adapt to a later starting age when it is clearly communicated and consistently implemented.

However, the pilot schemes have also encountered resistance from some parents and stakeholders who value the current system of choice and flexibility. Some parents have expressed concerns that a later starting age would disadvantage their children, particularly if they believe their child is advanced or ready for school at age 4. Others have expressed concerns about the loss of choice and the imposition of a one-size-fits-all approach.

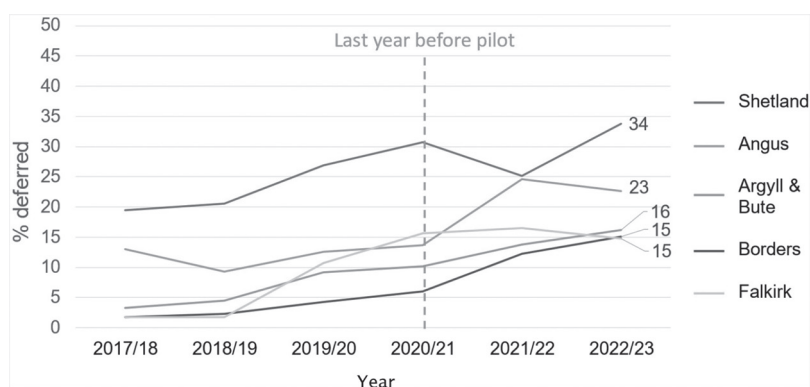


Fig. 6. August–December Deferral Rates in Pilot Local Authorities 2017/2018–2022/2023.

Source: Scottish Government (2023).

Note: Shows deferral rates in pilot local authorities following extension of funded childcare entitlement.

These concerns reflect genuine tensions in education policy between standardisation and flexibility, between collective benefit and individual choice, and between evidence-based policy and parental autonomy. However, it is important to recognise that the current system does not actually provide choice to all families equally. Only children born in certain months have the legal right to choice, and even among those who have this right, uptake is heavily skewed towards advantaged groups. The current system might be better described as providing choice to some families (primarily advantaged ones) while imposing the consequences of those choices on other families (primarily disadvantaged ones), with March- to July-born children having no say in the matter.

1.5. RAE IN EXTENDED COHORTS

While the bulk of RAE research has been conducted in contexts with standard 12-month cohorts, Scotland's extended cohorts create conditions for amplified RAEs that may be more severe than those documented in the international literature. Understanding the specific dynamics of RAE in extended cohorts is essential for appreciating the urgency of the Scottish situation.

1.5.1. The 19-month Cohort

In Scotland, school cohorts can span up to 19 months when deferral is taken into account. The youngest child in an extended cohort might be born in February and start school in August at age 4 years 5–6 months, while the oldest child in the same cohort might be born in August of the previous year, have deferred entry, and start school at age 5 years 11 months or just over 6 years old depending on the commencement day that year. This creates an age difference of 19 months – nearly 40% of the younger child's life at school entry.

To put this in perspective, consider the developmental differences between a 4.5-year-old and a 6-year-old. The older child has had 31% more time to develop physically, cognitively, emotionally, and socially. The physical differences are substantial: the older child is likely to be significantly taller, heavier, stronger, and more coordinated. The cognitive differences are equally significant: the older child has had more time to develop language skills, mathematical understanding, executive function, and general knowledge. The social and emotional differences may be most important of all: the older child has

had more time to develop emotional regulation, social skills, independence, and resilience.

These are not minor differences. They represent major developmental milestones and capabilities. Expecting these children to learn together, play together, and be assessed against the same standards is fundamentally unreasonable and creates conditions for systematic disadvantage for the younger children.

1.5.2. International Evidence on Extended Cohorts

While most RAE research has focused on standard 12-month cohorts, there is some international evidence on extended cohorts that is relevant to the Scottish context. In the United States, kindergarten redshirting has created extended cohorts in some schools and districts, and research on these contexts provides insights into the effects of extended cohorts.

Studies from the United States have found that extended cohorts are associated with worse developmental and academic outcomes for the youngest members of the cohort (Bassok & Reardon, 2013). The effects of being relatively young appear to be amplified in extended cohorts compared to standard cohorts, suggesting that the developmental mismatch created by larger age ranges has real consequences for children's experiences and outcomes.

1.5.3. Mechanisms of Amplified Effects

The Galatea effect is similarly amplified. A 4.5-year-old who is consistently outperformed by classmates who are up to 19 months older is likely to develop a more negative self-concept than a child who is outperformed by classmates who are up to 12 months older. The younger child in an extended cohort may come to see themselves as fundamentally less capable, not just slightly behind, because the performance gaps they observe are so large.

Beyond these psychological mechanisms, extended cohorts also create practical challenges for teachers and schools. Providing developmentally appropriate instruction and activities for a group of children spanning 19 months of development is substantially more difficult than providing for a group spanning 12 months. Teachers must differentiate instruction across a wider range of abilities and developmental stages, which may result in some children receiving instruction that is either too advanced or too basic for their developmental level. The children at the extremes of the age range – both the

youngest and the oldest – may be particularly poorly served by instruction aimed at the middle of the range.

1.5.4. The Overlap Problem

One of the most striking features of Scotland’s extended cohort system is the overlap between cohorts. Because cohorts can span 19 months, and because the gap between cohorts is only 12 months, there is a 7-month period of overlap where children born in the same months could be in either of two different school years depending on whether they or their older peers deferred.

When assessing RAE in the context of the Scottish educational system, a striking feature of which is that while schools appear to be composed of 13 sequential 12-month cohorts, they are 13 overlapping cohorts of up to 19 months. Fig. 7 illustrates how Scotland’s extended cohort policy creates potential 19-month spreads within school year groups.

For example, a child born in February 2020 who does not defer will be in the same school year as children born as early as August 2018 (who did defer). Meanwhile, a child born in February 2020 could be in the school year above a child born in August 2019 who deferred from the previous cohort. This creates a situation where children born from August to February of the same year could be in different school years and where children in the same school year could have birth dates spanning 19 months.

This overlap creates confusion and inequity. It means that a child’s educational experience depends not only on their own birth date but also on

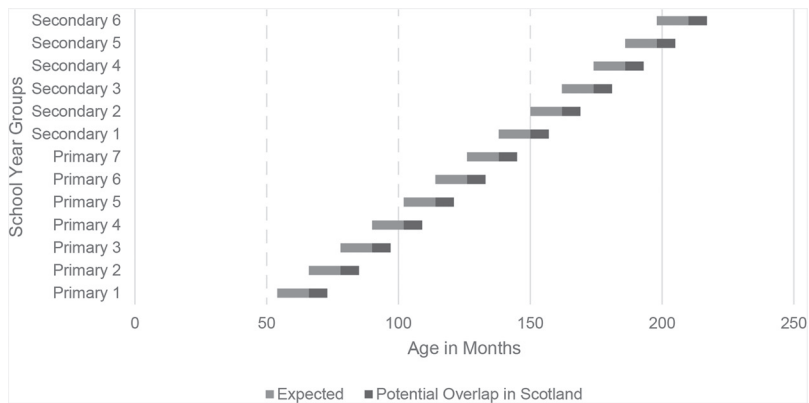


Fig. 7. Diagram Showing Overlap of Primary and Secondary Cohorts in Scotland.

the deferral decisions made by other families in their cohort. A child born in February who does not defer will have a very different experience depending on how many of their older peers (born in the previous year's winter months) deferred into their cohort. If many deferred, the February-born child will be among the youngest in a very extended cohort. If few deferred, the February-born child will be in a more standard cohort with a smaller age range.

This variability means that the effects of RAE are not consistent or predictable. Two children born on the same day in different parts of Scotland, or even in different schools within the same local authority, could have very different experiences depending on the local deferral rates. This postcode lottery is fundamentally unfair and represents a failure of the education system to provide consistent and equitable experiences for all children.

1.6. METHODOLOGY

This book employs a mixed-methods approach combining systematic literature review, policy analysis, and stakeholder engagement to examine the problem of RAE in extended cohorts in Scotland and to develop evidence-based policy recommendations.

1.6.1. Study Design

The overall study design can be characterised as a policy-focused research synthesis. The aim is not to generate new primary data on the effects of RAE or extended cohorts but rather to synthesise existing evidence, analyse current policies, and develop recommendations for policy change. This approach is appropriate given the substantial existing evidence base on RAE internationally and the urgent need for policy action in Scotland.

The study draws on multiple sources of evidence:

1. Peer-reviewed academic literature on RAE across multiple domains (health, education, sport, social development, economic outcomes).
2. Grey literature including government reports, policy documents, consultation responses, and advocacy materials.
3. Administrative data on deferral rates, school enrolment, and demographic patterns.

- 4. Stakeholder perspectives gathered through engagement with education officials, health professionals, teachers, parents, and advocacy organisations.

1.6.2. Six-key Criteria Framework

The problem was determined to be suitable using the ‘Six-key Criteria’ framework for policy assessment (Table 2).

1.6.3. Alternative Frames Analysis

An alternative frames analysis (SURE Collaboration, 2011) was used in order to aid in determining stakeholder perspectives and the frame most likely to lead to successful implementation (Table 3).

1.6.4. Fishbone Diagram: Causes of Extended Cohorts

A fishbone diagram (Fig. 8) was created to aid in identifying underlying causes and effects.

The fishbone analysis illustrates the economic, social/cultural, educational, and information factors – the underlying causes and consequences of extended cohorts and RAE in the Scottish educational system:

- 1. *Economic factors:* Historical lack of funded childcare; financial pressure on families to use free school provision; 2014 and 2023 funding decisions removing the main financial barriers to deferral.

Table 2. Six-key Criteria Framework for Policy Assessment.

Criterion	Description
Effectiveness	Evidence that the intervention reduces RAE or extended cohort effects
Feasibility	Practical implementability within the Scottish educational system
Equity	Impact on socio-economic, ethnic, and gender inequities
Acceptability	Likelihood of acceptance by key stakeholders
Sustainability	Long-term viability and resource requirements
Legality	Compatibility with existing Scottish legislation

Source: Adapted from the SURE Collaboration (2011).

Table 3. Alternative Frames Analysis for Extended Cohorts and RAE.

Frame	Proponents	Implications	Counter-evidence
Child readiness	Parents, some educators	Supports deferral as beneficial	Readiness testing invalid (Shepard, 1997)
Parental choice	Parent groups	Deferral as right	Inequitable uptake by SES
Administrative convenience	Local authorities	Maintain the current system	Harms to youngest children documented
Public health	Health professionals	Urgent reform needed	Extensive evidence base
Legal compliance	Legal framework	Default to legal age	Current practice inverts legislation

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Source: Adapted from the SURE Collaboration (2011).

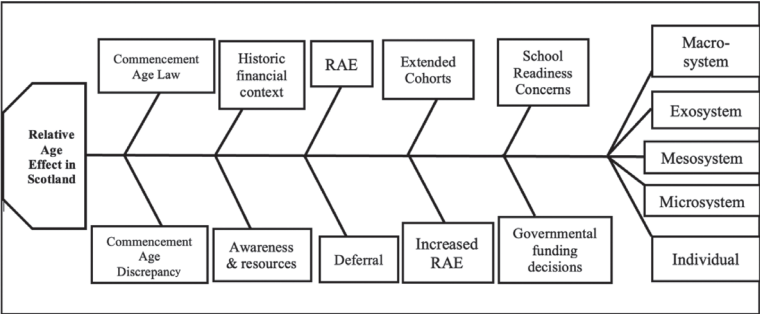


Fig. 8. Fishbone Diagram Exploring Underlying Causes of Extended Scottish Cohort.

Source: Adapted from the SURE Collaboration (2011).

2. *Social/cultural factors:* Awareness of RAE research among educated parents; concerns about school readiness; desire for competitive advantage; social pressure and normalisation of deferral; cultural tendency not to defer girls.
3. *Educational factors:* CfE emphasis on play-based learning not fully implemented; concerns about formal academic expectations; variation in school readiness of settings.
4. *Information factors:* Misunderstanding of RAE research; presentation of RAE evidence as supporting deferral; lack of public awareness of extended cohort harms; limited research in extended cohort context; lack of research in Scottish context.

This analysis reveals that extended cohorts have emerged from the interaction of multiple factors across different domains, not from any single cause. This has implications for policy solutions, suggesting that effective interventions will need to address multiple contributing factors rather than focusing on any single element.

1.6.5. Stakeholder Engagement

Stakeholder engagement was conducted through multiple channels:

1. *Formal consultation*: Written requests for input sent to key organisations including Scottish Government education and health departments, Education Scotland (2019), local authority education departments, teaching unions, parent organisations, and health professional bodies.
2. *Informal consultation*: Conversations with teachers, school administrators, public health professionals, and parents to understand perspectives and experiences.
3. *Analysis of consultation responses*: Review of responses to previous government consultations on school starting age and deferral.
4. *Review of advocacy materials*: Analysis of materials produced by organisations advocating for expanded deferral rights.

Stakeholders who engaged provided valuable historical context on how the current system evolved, insights into the barriers to change, and perspectives on the acceptability and feasibility of different policy options. However, it is important to note that not all stakeholders engaged with the consultation process, and those who did engage may not be representative of all perspectives. In particular, families from disadvantaged backgrounds and ethnic minority communities were under-represented in the engagement process, despite being most affected by the inequities of the current system.

1.7. PROBLEM ANALYSIS

The evidence and analysis presented in this chapter point to four principal challenges that must be addressed to resolve the problem of RAE in extended cohorts in Scotland.

1.7.1. Challenge A: School Readiness Concerns

The first challenge is the widespread belief among some parents and professionals that children born in the winter months are not ‘ready’ for school at age 4 and therefore need to defer entry. This belief has been used to justify both individual deferral decisions and policy changes to expand access to funded deferral.

As discussed in Section 1.3.2, the concept of school readiness is disputed, and the evidence does not support the use of deferral as a solution to readiness concerns. However, in the context of the tradition of commencing earlier than the legal commencement age and increasing deferral back to the legal commencement age, this form of deferral does solve readiness issues caused by early commencement. More widely than artificially creating a readiness issue through default advancement, the school readiness concept is better understood as a characteristic of the setting rather than the child and is better addressed by ensuring that schools are ready for children at whatever developmental stage they arrive. The emphasis on play-based learning in the CfE should, in theory, make schools ready for children aged between 5 and 6 as well as appropriately selected four-year-olds, though there are questions about whether the CfE is being fully implemented in practice.

The persistence of school readiness concerns despite the play-based curriculum suggests that the concerns may be about something other than readiness for formal instruction. They may reflect concerns about relative age disadvantage (which is a real concern but is exacerbated rather than solved by deferral), concerns about competitive advantage (which is a private benefit that creates collective harm), or concerns about the quality of early years provision in schools (which should be addressed by improving provision rather than by excluding younger children).

Addressing this challenge requires both education and policy change. Parents and professionals need better information about what school readiness actually means, about the evidence on deferral, and about the harms of extended cohorts. At the same time, schools need to ensure that they are genuinely providing developmentally appropriate, play-based learning in the early years so that concerns about children being pushed into formal instruction too early are addressed.

1.7.2. Challenge B: Discrepancy Between Legal and Customary Commencement Ages

The second challenge is the discrepancy between the legal commencement age (August after turning five) and the customary commencement age (August

after turning four for children born before March). This discrepancy has created confusion, inequity, and the conditions for extended cohorts to emerge.

The legal framework is clear: children must commence education in the August after turning five. The provision for early entry if you will turn five by the latest permitted date (customarily accepted as August after turning four for children born before March) was intended as an option, not as the default. However, through administrative custom, early entry has become the assumed default, and the legal commencement age has come to be seen as ‘deferral’ or ‘delayed entry’.

This inversion of the legal framework must be corrected. The legal commencement age should be the default, and any departure from this should be clearly understood as an exception requiring justification. This would align practice with legislation, reduce confusion, and create the foundation for 12-month cohorts rather than extended cohorts.

Correcting this discrepancy will require changes to administrative systems, guidance to local authorities, and communication to parents. It will also require addressing concerns from parents who have come to expect early entry and who may perceive a shift to the legal commencement age as a loss of service or opportunity.

1.7.3. Challenge C: Deferral as Individual Choice With Collective Consequences

The third challenge is the framing of deferral as an individual choice that parents should be free to make for their own child, without adequate consideration of the collective consequences of these individual choices.

When individual families choose to defer, they are making a decision that they believe is in their child’s best interest. They are seeking to protect their child from the disadvantages of being relatively young in the cohort by making them relatively old instead. From the perspective of the individual family, this may appear to be a rational and beneficial choice.

However, when many families make this choice, the collective consequences are harmful. Each child who defers makes the cohort more extended, increasing the age range and amplifying RAE for the children who do not defer. The children who do not defer, who are disproportionately from disadvantaged backgrounds, bear the costs of other families’ choices. This is a classic collective action problem where individually rational choices create collectively harmful outcomes.

It should also be noted that this framing as individual choice that all parents should be free to make has never been available to parents of children born in March until July, undermining the universality of the principle. Furthermore, initially, this ‘choice’ was only open to children born in January and February and traditionally actively denied to those born from August until December despite this being in direct opposition to the law.

1.7.4. Challenge D: RAE in Extended Cohorts Requires Both Structural Correction and Mitigation

Both structural correction and mitigation are necessary. Structural correction without mitigation would reduce but not eliminate RAE. Mitigation without structural correction would attempt to address the symptoms while leaving the underlying cause (extended cohorts) in place.

1.7.5. Problem Analysis Model

The relationships between these four challenges and their contributing factors can be represented in a problem analysis model (Fig. 9).

The model shows that:

1. Extended cohorts (19 months) are the central problem, created by the interaction of early entry as customary default and increasing deferral rates.
2. Early entry as default results from the discrepancy between legal and customary commencement ages (Challenge B).
3. Increasing deferral results from school readiness concerns (Challenge A) and the framing of deferral as individual choice (Challenge C).
4. Amplified RAE results from extended cohorts and affects multiple domains (health, education, social, economic).
5. Inequitable outcomes result from amplified RAE and from demographic patterns of deferral.
6. Solutions must address both structural correction (reducing cohort size) and mitigation (reducing RAE effects within cohorts) (Challenge D).

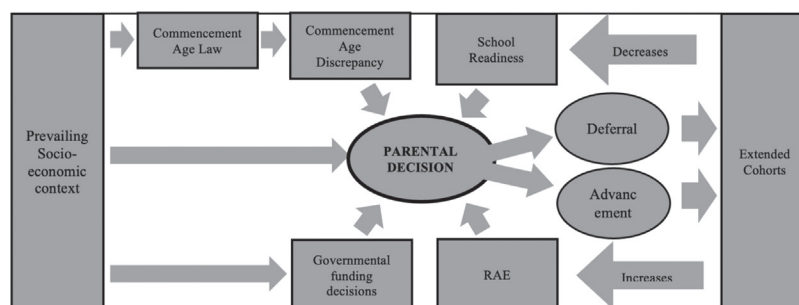


Fig. 9. Problem Analysis Model.

This model provides a framework for understanding how the various elements of the problem relate to each other and how interventions at different points in the system might address the problem. It makes clear that there is no single simple solution, but rather that effective intervention will require coordinated action across multiple domains.

1.8. SUMMARY

This chapter has established that Scotland faces a significant but underappreciated public health problem in the form of amplified RAEs resulting from extended school cohorts. The evidence demonstrates that:

1. RAE is a well-documented phenomenon with consistent effects across mental health, learning disabilities, physical injury, academic attainment, and economic outcomes: being relatively younger in a cohort is disadvantageous.
2. Scotland's educational system has created extended cohorts spanning up to 19 months – far exceeding international norms – through the interaction of legislative provisions, administrative customs, and individual deferral choices.
3. Four principal challenges must be addressed: school readiness concerns that are not evidence based and are contributed to by extending cohorts, discrepancy between legal and customary commencement ages, framing of deferral as individual choice without consideration of collective consequences, and the need for structural correction alongside mitigation measures.

The evidence base is sufficient to justify urgent policy action. Despite gaps in Scottish-specific research, the overall pattern is clear and consistent: the current system causes preventable harm to children, disproportionately affecting those from disadvantaged backgrounds. Subsequent chapters present the detailed evidence review, policy options, and implementation strategy. The aim is to provide policymakers, practitioners, and advocates with the evidence and analysis needed to drive meaningful change in Scotland's school commencement system.

KEY TAKEAWAYS

- *RAE is a significant public health issue:* Being relatively younger in school cohorts is associated with mental health problems, learning disabilities, physical injuries, reduced academic attainment, and diminished career opportunities across the life course.
- *Scotland's 19-month cohorts are internationally unusual and amplify RAE:* Extended cohorts create developmental mismatches far exceeding international norms, with the youngest children facing challenges nearly 40% greater than in standard 12-month cohorts.
- *Recent funding decisions have worsened the problem but simultaneously set conditions to resolve it:* Removing the main financial barrier to deferral has increased deferral rates and further extended cohorts; meanwhile, demographic inequities in deferral uptake persist but could be resolved by the adoption of commencement in line with the law (deferral) as the default.
- *Solutions require both structural correction and mitigation:* Reducing cohorts to 12 months by aligning practice with legal commencement age is essential, but mitigation measures to reduce RAE effects within cohorts are also needed.

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