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An exploration of factors affecting the baseline assessment scores of children attending morning or afternoon sessions in nursery settings in Wales

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ABSTRACT

Nursery practitioners often highlight the difference between the children who attend morning sessions and those who attend afternoon sessions, with the feeling that the morning session children are more receptive and show greater improvement in their development than those who attend in the afternoon, but no specific data OR evidence has been presented to support this assertion. Statistical analysis of baseline assessment results was undertaken to determine any significance or correlation and the results indicated that children who attended morning sessions were statistically likely to achieve 2 points higher on average in their baseline assessment scores. This would suggest that children who attend afternoon sessions are starting their educational journey with lower basic skills than those who attend in the morning and this could affect their school readiness.

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KEYWORDS

Nursery attendance; baseline assessment; admission policy; intake criteria; assessment pedagogy

Background

State-funded early years settings in the UK usually offer children a part-time place for 2.5 hours a day and allocate them into either a morning or afternoon session, with the same activities delivered in each session. Whilst working as an advisory teacher, the researcher became aware that there appeared to be a common understanding amongst early years practitioners that there was a difference between these two groups, with morning session children perceived as being more receptive to learning and making greater developmental progress than those who attended in the afternoon. During informal, incidental conversations with practitioners to explore the reasons for this perception, staff acknowledged that they had no evidence to support this belief.

In order to explore this perception, a brief initial study was taken within one nursery school to compare the baseline assessment scores of children attending the different sessions which revealed that children who attended morning sessions had higher average assessment scores than those who attended in the afternoon when they started nursery and the gap was still evident at the end of the year. These initial findings appeared to support the practitioners' perceptions and the work of Chung et al. (2019) who presented similar views, concluding that fatigue in first graders affected children's behaviour which

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in turn could affect academic performance. They linked fatigue to aggression, hyperactivity and conduct problems which could affect a child's ability to concentrate upon a task or engage effectively with a practitioner or a learning activity, and suggested that children were more alert in the morning so the negative behaviours were more prevalent in the afternoon. These findings would suggest that children who were assessed in afternoon sessions were less likely to be able to engage fully in the tasks they were required to undertake. This seemed to contradict the work done by Belísio et al. (2016) who found that the reduction in night-time sleep experienced by children who had to be woken up to attend morning sessions resulted in lower levels of sustained attention and greater levels of sleepiness. Research has looked at the benefits and challenges associated with attendance at half-day or full-day sessions with a specific focus on children affected by factors such as poverty, disability or race or looking at particular areas of development such as physical activity or pre-reading skills but these studies do not examine the potential issues related to morning or afternoon attendance (Brannon 2005; Brownell et al. 2015; Leow and Wen 2016; Hahn et al. 2014; Gottfried and Le 2016; Crane et al. 2012; Thompson and Sonnenschein 2016).

The benefits associated with children receiving high-quality early years education are well documented and there are a number of factors that have been recognised as impacting upon a child's progress during this phase (Bakken, Brown, and Downing 2017). Melhuish and Gardiner (2018) highlight the significance of structural factors such as staff training and qualifications on the quality of experience that children receive, noting that nursery schools and classes score highly on these factors so are more likely to use best practice pedagogies. The level of involvement and interest that parents have in their child's learning and development has a significant effect on children's outcomes (Antova 2018) as do sociological, pedagogic and economic factors, as illustrated by Siraj-Blatchford and Clarke's (2000) comments about children's choice of activity,

In asserting their masculinity, white working-class boys might choose gross-motor construction activities over reading or pre-reading activities Class, gender and ethnicity are all complicit here and the permutations are simple, but they do exist and do lead to underachievement (p. 8)

The age at which children start education has also been recognised as a factor linked to attainment particularly for summer-born children or children born prematurely, with studies suggesting these children have poorer outcomes and a higher likelihood of having additional learning needs such as developmental dyslexia (Verachtert et al. 2010; Crosser 1991). The significance of the season of birth has been acknowledged in the UK with parents able to request delayed school admission for summer-born children. These examples of factors that impact on the success of children's early learning experiences are well researched and recognised, however, it is not known whether the session attended could further magnify or affect their impact.

The purpose and role of early years education before compulsory school age in preparing children for school is also relevant here. The concept of school readiness and whether children should be ready for school or schools should be ready for children relates directly to the contested issue of defining attainment and achievement within early years of education. Tymms, Merrell, and Jones (2004) highlighted the challenges associated with accurately interpreting the achievements of children

during or at the end of a period of schooling without knowing the progress that they have made since they started school. They suggested the use of baseline assessments such as Performance Indicators in Primary Schools (PIPs) to record a clear start point against which individual children's educational progress could be measured. Subsequently, PIPs or other forms of baseline assessment have been introduced in a wide range of countries as a way of measuring the 'value added' by educational experiences and giving a fairer picture of the progress made than using 'raw' end of phase test results which assume everyone starts at the same level. The robustness and usefulness of the data taken from PIPs baseline assessments have been widely acknowledged and used to inform a range of studies including research into children's learning, the effectiveness of assessments and early education pedagogy (Hawker 2015).

The debate around early years curricula, what should be assessed, how assessment should be undertaken and the appropriateness and usefulness of baseline assessments, is ongoing in the UK (Deluca and Hughes 2014; Scott 2018; Tindal et al. 2015; Jarvis 2017; Archer 2017; Roberts-Holmes and Bradbury 2017). Clearly the outcome of a standardised, summative or centrally administered assessment such as the baseline can only reflect the specific skill or concept that was being assessed, it cannot capture the holistic development and idiosyncratic characteristics of the child. However, regardless of the debates, the fact remains that currently baseline assessment scores are used as evidence for the starting point of a child's educational journey. The scores can show the value added by early education provision (within the parameters of the areas being assessed), they can indicate potential areas of additional need and provide educators with data that they can base pedagogic decisions upon, and as such they have a value.

Children with lower baseline scores could be seen as needing to 'catch up' as they are starting from further back on the assessment profile and this could have implications for pedagogy and practice in early years settings with pressure on practitioners to focus on skill-specific activities that will improve assessment scores for children with lower baselines rather than promoting more child-led experiential learning approaches. This links to the wider debate in the field of early education and care about the deficit versus the capable and competent view of the child and the extent to which the pedagogies used in settings value the child's contribution in the present or focus on what needs to be added or developed to fulfil their future potential (Wragg 2013). The allocation of a 'starting point' score to a child which allows them to be ranked on a scale leans towards the deficit model, suggesting that those with lower scores need additional and specific learning experiences to get them to the 'norm'. The baseline does not give any opportunity to recognise a child's individual skills, interests or aptitudes which might lie outside the requirements of the assessment.

The potential pedagogical impact, suitability and usefulness of baseline assessments and any associated effect of these on children's attainment are important areas of study. The extent to which the session that a child attends may further influence the outcome of the assessment has not been explored and so this study aims to introduce that consideration to the discussion.

Method

Settings and sample

The study was conducted within one local authority situated in the South Wales valleys. A convenience sampling strategy was employed, with the settings being in close proximity to the researcher and their previous work in the authority enabling relatively straightforward access. The sample comprised all the settings in the authority that delivered a morning and an afternoon session. Welsh government data stated that 23% of pupils were entitled to free school meals and there were major variations in employment and socioeconomics between wards within the authority. Indicators of family poverty (lone parents with three or more children and no earners) placed the authority within the top 10 in Wales. It also had one of the highest teenage pregnancy rates and above-average long-term unemployment, with particular issues around youth unemployment with 14% of 16-year olds not going onto further education, training or employment.

Ten settings in the authority delivered morning and afternoon nursery sessions. There were three nursery schools, two nursery classes within infant schools and five nursery classes within primary schools. The baseline assessment scores from children attending morning or afternoon sessions in all these settings were the data set used to examine achievement levels. The total sample size was 593 children (morning girls $n = 151$, morning boys $n = 152$, afternoon girls $n = 148$, afternoon boys $n = 142$). Data were examined according to gender as this information was included with each child's results so the opportunity was taken to see if this presented any issues or helped to clarify any findings.

Ethical considerations

Permission to contact the settings and access the baseline assessment data was gained from the local authority advisory team. When this permission had been gained each setting was contacted via email to the headteacher. The email outlined the purpose and requirements of the study and included an information sheet evidencing that it would be conducted in accordance with British Educational Research Association (2018) guidelines. Headteachers were asked to reply to the email to confirm whether they would give consent for their setting to be included in the study and they all confirmed this. Prior to the study, the researcher had worked in the local authority, initially as a nursery teacher and then as an advisory teacher delivering training and guidance to all settings within the authority. This meant there was a level of familiarity and insider knowledge that needed to be acknowledged. The previous connections within the authority may have made permission easier to gain as the relevant personnel and gatekeepers were known and so access was straightforward.

The baseline assessment data collected for submission to the local authority did not include children's names, each score was given an alphanumeric identifier that showed whether the child was male or female and what their age was when they were assessed so it was not possible to identify individual children. There was not

a requirement to identify which session each child attended in the data submitted to the local authority so settings were asked to indicate this on the data set provided for this study by adding 'AM' or 'PM' to the alpha-numeric identifiers.

Settings were also asked to identify a member of staff who would be willing to be interviewed and an additional information and consent sheet was provided for these participants which outlined why they had been asked to participate, what they would be required to do and what would happen to the information they provided. Participants' confidentiality and anonymity were assured and they were informed of the right to withdraw from the study by a set date.

The baseline assessment

In Wales, the baseline assessment forms a key part of the 'Foundation Phase' early years curriculum (Welsh Government 2017). There is a formal requirement for all children to be assessed when they start their compulsory education and children who attend nursery settings in the year prior to starting compulsory education are also assessed using the baseline scheme. All the settings within the local authority were required to use the same baseline assessment scheme. The assessments had to be administered within the child's first 20 sessions in the setting and the scores were sent to the local authority for their records. Scores were also recorded on individual children's records to be shared with reception staff when the child moved on from nursery. The assessment scores were based on practitioner observations of children and all staff who administered the assessments had undergone training delivered by the local authority advisory team to ensure as much parity of approach as possible.

The baseline assessment used in the local authority was organised around three areas of child development. These were titled as 'language and literacy', 'mathematical development' and 'personal and social' within the assessment documentation. The assessment comprised of seven language and literacy elements, eight mathematical development elements and three personal and social elements. A mark scale of 'N' to '4' was used, with 'N' meaning the child was unable or unwilling to participate in the activity and '4' meaning that they demonstrated higher than average skills, knowledge or understanding. The maximum total score that a child could achieve was 72, with a maximum score of 28 available for the language and literacy category, 32 for mathematical development and 12 for personal and social.

The assessment scheme broke down the three areas of development into a range of skills associated to the area and then outlined specific tasks that practitioners presented to children to assess their level of achievement using a set criteria outlining precisely what a child had to do in order to achieve a level for each element of the assessment. For example, within the 'mathematical development' area the skill of counting was assessed against the criteria shown in [Table 1](#).

Table 1. Baseline assessment criteria for counting.

Counting	
N	Unable or unwilling
1	Recites numbers, some in sequence, random start point
2	Recites numbers 1–10
3	Touch counts objects to 5 (Objects placed in line)
4	Can count 10 objects accurately (Objects placed randomly)

Procedures

The baseline assessment results were sorted according to session attended and gender. Each child's total score for language and literacy, mathematical development and personal and social development was calculated and these were combined to give every child an individual overall total score. These scores were then used to calculate the mean average score for the morning and afternoon sessions in each setting and then combined to give an overall mean average score across all settings. Mean average scores for the three assessment categories and for gender were also calculated according to session attended in order to enable a more detailed comparison of achievement (Table 2).

The scores had a normal distribution and two variables (morning session and afternoon session) so a parametric t-test was undertaken on the individual overall baseline total scores of each child using SPSS to assess whether the scores of the morning and afternoon groups were statistically different relative to their variability. Pearson's correlation coefficients were calculated to identify any relationships between the achievement of children in each session and Spearman's rank order correlation was used to examine the data for evidence of correlation. An overall alpha level of .05 was used for all analyses.

In order to identify possible reasons for differing achievement or factors that could affect achievement informal interviews were held with staff in the various nursery settings. Interviews were conducted with one practitioner in each setting who worked directly with the nursery children in both sessions and administered the baseline assessment. The initial request sent to settings asking them to participate in the study asked for a relevant member of staff to volunteer to be interviewed and so the sample was self-selected. The sample comprised 10 practitioners in total (headteachers $n = 3$, class teachers $n = 5$, learning support assistants $n = 2$). All the interviewees were female. Interviews were held in the various settings at a day and time identified as convenient by the interviewee and were recorded using a mobile phone. The staff interviewed were not given the data showing average scores of the morning and afternoon sessions prior to their interview. The interviews used an informal semi-structured approach based on two key questions

Table 2. Mean average baseline scores by category.

	Language and Literacy	Mathematical Development	Personal and Social	Total
Girls (a.m)	13.2	12.4	6.9	32.4
Girls (p.m)	12.5	11.3	6.7	30.6
Boys (a.m)	11.0	11.3	6.0	28.3
Boys (p.m)	10.5	10.4	6.0	27.2
All a.m children	12.2	11.9	6.5	30.4
All p.m children	11.6	10.8	6.4	28.4

- (1) Do you think there is a difference in achievement between the children who attend in the morning and those who attend in the afternoon?
- (2) Why do you think this?

Each practitioner was asked these key questions and then follow-up questions were asked to clarify or explore the answers given. This allowed the interviewees freedom to express their personal views and opinions and explore issues as they arose within the course of the interview. The use of key questions gave a level of parity of experience across the sample by making sure that the same initial opportunities were considered in each setting. Each participant was interviewed once, with the interviews taking place over a two-week period.

The interviews were transcribed and preliminary exploratory analysis of the transcripts was undertaken to gain a general identification of recurrent keywords or phrases. When the initial analysis of each interview was complete the keywords and phrases were cross-referenced across the sample to look for frequency and identify themes.

Results and discussion

The mean average score of children who attended morning sessions was 2 points higher than that of children who attended in the afternoon (morning average score = 30.4, afternoon average score = 28.4). The results from the Spearman's rank order correlation ($r = 0.72$) and from Pearson's product moment test ($r = 0.80$) indicated a high level of correlation and a strong relationship between the baseline score achieved and the session attended. The t-test result ($p > 0.013$) indicated that the difference in achievement was statistically significant with a 95% likelihood that a child who attended a morning session would score 2 points higher than a child who attended in the afternoon.

Comparison of the total literacy, numeracy and personal and social mean average scores showed that those of the morning session children were higher than those of the afternoon session children in all categories. The range of scores was greater in the morning session children in all categories except girls' literacy, where the morning girls' scores ranged over 20 marks compared to the afternoon range of 23, and total literacy with the morning score range being 24 compared to 25 for the afternoon. In every area except girls' literacy, a morning session child achieved the highest score in the assessments, but when considering these scores the potential impact of practitioners on the assessment process needs to be considered. The fact that girls achieved higher average scores in almost all categories could reflect practitioners' unconscious perceptions of girls having better communication and interaction skills (Kreitz-Sandberg 2016; Priolella 2018). This also relates to the potential of self-fulfilling prophecy where practitioners believe that children in afternoon sessions will not score highly and so unconsciously award lower scores to those children. Kowalski et al. (2018) highlight a range of factors that result in early years practitioners demonstrating unconscious bias when assessing young children. These included a tendency to conflate social and cognitive development skills, the impact of their own attitudes to the assessment process and the amount of time they had worked in the field, and Blömeke, Dunekacke, and Jenßen (2017) suggest that some of these biases are evident before practitioners start their training programmes. The issue of unconscious bias could also relate to the socio-economic profile of the Local Authority

area which, as noted previously, featured a number of indicators of family poverty. Auwater and Aruguete (Auwater and Aruguete 2008) show that practitioners make judgements based on perceptions related to socio-economic factors and these could negatively impact upon scores awarded. One of the practitioners made the suggestion that staff are more likely to be tired in afternoon sessions which link to the findings of Lee et al. (2006) who showed that practitioners who deliver full-day early years programmes engage in less formal pedagogic input than those who deliver half-day sessions, but the study did not examine whether the amount of input differed throughout the day. If more practitioner focus and energy is directed to morning session children this could be an explanation for that session's higher average scores.

Structure of the baseline assessment

Whilst the statistical analysis indicated a significant difference in achievement the reasons for this disparity are less clear. Closer inspection of some of the scores in specific category could offer some explanation. The smallest average score difference was evident in the personal and social categories, with an overall difference of just 0.1 in the total scores and no difference at all between the boys' scores. There are only three criteria assessed within this category, which could account for a lower range of difference as there are fewer marks available, but it is also worth considering the nature of what was being assessed. The criteria for the personal and social element of the assessment focussed on how children play with each other and interact with their environment, skills which could be seen as innate rather than dependent on specific knowledge. Conversely, the language and literacy and mathematical development criteria have more knowledge-based or task-specific focuses such as counting or reciting rhymes. These skills are more dependent on the learning experiences and opportunities the child has had prior to starting nursery and link to the impact of 'living and working conditions' and 'social and community networks' identified by Camacho et al. (2019) as being significant factors affecting school readiness. The fact that the language and literacy and mathematical development categories have more marks attached to them mean that children who have had more specific learning experiences before starting nursery can score more highly and thus the total scores are skewed towards this group. The interview responses given by practitioners suggested that parents who were facing challenging or chaotic home situations related to socio-economic difficulties tended to put in applications late and often had to be reminded to apply by health visitors. These home situations were highlighted by practitioners as being likely to impact negatively on the factors identified above as being conducive to enabling parents to provide 'rich' learning experiences and opportunities prior to starting nursery. The local authority allocate nursery places on a 'first come, first served' basis and the interview data suggests that this intake criteria is clustering children who have had richer or more 'educational' experiences and input before starting nursery and who are therefore more likely to score highly in the knowledge-based categories into morning sessions.

Administration of the baseline assessment

As well as the potential impact of practitioner perceptions, the way in which the assessment is administered needs to be considered. The criteria for 'personal and social' are judged solely via observation with no requirement for the child to interact with the practitioner, for example noting whether the child plays alone or in parallel, and this category has the least amount of points attached to it. In the other categories the tasks are more dependent on children being able to listen to, understand and respond to questions or instructions given by the practitioner such as 'what colour is this?'. McInnes et al (2011, 2013) note the impact that practitioners' interventions into children's activities can affect understanding of the purpose of the activity, notably whether the activity is 'play' or not. They suggest that co-constructed pedagogies result in more long-term learning benefits, but there are limited opportunities to develop these approaches within the tasks specified by the assessment. It should be remembered that the assessment takes place during the child's first sessions in the setting, when they will not be familiar with the practitioner, the routine or the location. In order to respond to the question the child needs to be comfortable and confident to enter this new situation and to interact with the practitioner, and they need to understand the context and the reason for the request in order to complete the activities (Jarvis 2017). With this in mind it could be suggested that the score for these criteria is related more to the child's ability to settle into the new environment than to their specific knowledge or skills, which again is dependent on the child's prior experiences.

Practitioner views

The responses from staff showed that in nine of the ten settings staff felt that morning session children performed better, and the results of the one setting where the practitioner who disagreed showed that their belief was valid as in that setting the afternoon mean average score was higher than the morning one. Many of the views expressed by staff related to factors identified in the literature presented earlier. The impact of parental involvement and engagement was suggested as a key contributory factor, with staff noting that attendance levels were usually lower in the afternoon, with more unauthorised absences than in the morning sessions which limited the amount and consistency of experiences received by the children and this disruption impacted negatively on their achievement. The nature of unauthorised absence means that it is not possible to identify why the child did not attend, and whilst the staff felt this related to parental disengagement there could be a number of other explanations and as such this view has to be presented as speculation. In contradiction to Belísio et al.'s (2016) findings the staff felt that children who attended in the morning were more alert and receptive and afternoon session children were more likely to be tired and irritable but the staff also applied this issue to themselves, suggesting that the same could be said of staff and that this could impact on the quality of experience delivered in the afternoon sessions. One member of staff felt that the food afternoon children ate for lunch affected their behaviour by making them lethargic or hyperactive which was not a factor that had been considered previously.

Intake policy

The quantitative nature of the data meant it was not possible to isolate a specific cause for the difference in scores. The Local Authority used a 'first come, first served' intake policy to allocate sessions and that could cluster groups affected by a particular factor together into a particular session. For example, late applications may be more likely to have come from parents who were in difficult or chaotic situations or who had poorer basic skills and the intake policy would have allocated their children into afternoon sessions. The link between parental basic skills and children's basic skills could then be reflected in the lower baseline scores. This would support the views given by the practitioners suggesting that parents of afternoon session children were more likely to be affected by issues which prevented them from getting their child into the session.

Whilst there are other criteria that can be used to inform intake policy and process, such as organising children by age for example, until there is clearer data on what causes the difference in achievement and why these effects are clustering children into a particular session it is difficult to identify what would be best practice. Clearly intake policy and criteria is a key feature which needs to be examined with regard to trying to reduce the difference in attainment, the development of more individualised and flexible methods and systems is one area that could be further explored. For example, if there are factors related to parental engagement or home environment then the development of information sharing processes with health visitors or other services to identify the session that the parent is most likely to be able to get their child to and devising an intake policy to accommodate this flexibility would be useful.

One way to reduce the potential advantage or disadvantage of attending a particular session could be to swap sessions mid-year, but implications of this are significant. One of the main issues would be the justification of the change to the parents whose children attend morning sessions who could feel their child was then being disadvantaged in the second half of the year. It could also be seen as unfair towards engaged parents who complete and return applications promptly. If, as suggested in the staff interviews, disengaged parents are less likely to bring their children to afternoon sessions then questions are raised about whether they would be more likely to get their children to morning sessions and reduced attendance rates have an impact on the establishment of daily routines within settings which can affect learning (Fuligni et al. 2012). Whilst changes to intake policy would require change at a local government level, individual settings could instigate small-scale approaches to try and reduce the impact of factors that may be affecting children in afternoon sessions more than those in morning sessions.

Limitations

The study as a whole was small scale, based on one year's data in one local authority area. Although the data collected in the researcher's own setting for two years subsequent to this did also show the same difference between average scores in morning and afternoon children the generalisability of these findings is limited and would require further studies. The data used did not include assessment scores for children diagnosed with additional learning needs or children who were attending nursery on a full-time basis, and whilst

these were very small numbers it is possible that including their data could present new issues. The researcher's familiarity with the staff and settings in the authority had an impact on the responses given during the interviews, with participants often giving responses that alluded to a shared knowledge such as 'you know what it's like' and this insider knowledge may have led them to give opinions that they would not have divulged to an unknown party. This prior connection also meant that the researcher had been involved in informal, incidental conversations which were where the idea of a possible difference between children attending the different sessions had first emerged and so the potential of researcher bias also needs to be acknowledged.

Conclusion

The statistical analysis of the baseline scores strongly indicated that children who attended morning sessions gained higher assessment scores than children who attended afternoon sessions, but clearly the physical act of being present in either a morning or afternoon session is not what creates this difference. The early years of a child's education are crucial and any factors that could negatively impact progress and attainment need to be identified and considered. The discussion above presents a range of potential factors that could influence the achievement of children in the different sessions, such as parental engagement and assessment design. Whilst these factors are extensively researched and can be applied to each setting at some level the significance of each factor and reason for the potential clustering of children impacted by a particular factor into a morning or afternoon session cannot be established here. The data presented suggests that children who attend afternoon sessions are starting their education with lower developmental levels than those who attend in the morning, or being labelled as being lower according to assessment results and these results are important as they are used to make judgements about children's potential (Roberts-Holmes and Bradbury 2017; Scott 2018). Further research is required to unpick the factors that result in the clustering of children in afternoon sessions and action is necessary to try to reduce that impact and try to provide opportunities to maximise equity of opportunity such as identifying those children affected by the risk factors. The findings of this study have implications for the intake policies used by local authorities and for the pedagogies used in the administration of baseline assessments, suggesting that the use of more flexible or bespoke intake criteria and assessments based on interventions that focus on what a child can do are needed in order to maximise the learning and development opportunities for all children in any session.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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