

THE DISCURSIVE FABRICATION OF THE DESIRED CHILD IN EARLY CHILDHOOD MATHEMATICS EDUCATION IN SWEDEN

Laurence Delacour and Anna Chronaki

University of Malmö, Sweden
Laurence.delacour@mau.se, anna.chronaki@mau.se

ABSTRACT

Swedish early years mathematics education is currently under discussion, as it is experiencing transformation on several levels. A few years ago PISA results showed that Sweden ranks below certain highly developed countries. The importance of mathematics has consequently become a prevailing discourse, with the aim of safeguarding a top ranking for Sweden. At the same time, increased population mobility towards Sweden over past decades has resulted in the contemporary school setting being characterised by cultural and linguistic diversity. Based on a series of interviews and observations, this paper analyses how preschool teachers tend to fabricate mathematics education and the desired child in a context where conflicting discourses of school mathematics and early childhood education circulate. This study also explores whether certain children run the risk of being excluded as “other”.

Keywords: early childhood education; discourse; mathematics.

Introduction

This study took place in Sweden at a time when the government was putting pressure on early years education policymakers to adjust the curriculum to global standards. These adjustments were required due to increased competition in the context of international assessment comparative practices. A couple of years ago, PISA results on children’s competencies in basic mathematics indicated that Sweden ranks behind certain highly developed countries (i.e. in a comparison between Sweden, mainly Northern European countries, Scandinavian countries and the US). Thus, a focus on “mathematics for all” began to circulate as the most effective way to safeguard a top position for Sweden (OECD, 2017). To increase schoolchildren’s ability to compete on an international level, politicians, educational policy

makers, bureaucrats, teachers and parents in many countries have put forward arguments regarding the possible societal gains of an investment in the mathematical development of pre-schoolers (Walkerdine, 1998; Taguma, Litjens, & Makowiecki, 2012).

It has been internationally argued that starting early in order to excel in mathematics is a cornerstone not only for an individual's personal growth and later success, but also for society's democratic development (OECD, 2017; Government Offices, 2010). Preschool education is seen as an investment in prevention of the achievement gap and as part of a lifelong learning strategy commonly associated with scholastic and academic success. This argument is exemplified by the formation of specific curricula and teacher education programmes, which have been followed by evaluations and comparative assessment practices in later stages (Walkerdine, 1998; Popkewitz, 2004). At the same time, increased population mobility over the past decades has resulted in the contemporary school setting being increasingly characterised by cultural and linguistic diversity. Migrant students are often described as performing poorly in school – a deficit discourse that prevails in recent research examining why students fail in mathematics (Clements & Sarama, 2015). According to OECD (2017a), early childhood education is particularly important for immigrant children: the skills and competencies these children gain in early year's mathematics activities and the ways in which they perform in tests are directly reflected in PISA scores, which then affect how certain countries and their educational systems are ranked.

“Educare” is an abbreviation that refers to the Swedish approach to preschool; it aims to integrate educational and caregiving practices in order to support the holistic development of children between the ages of one and six (Doverborg, Pramling & Pramling Samuelsson, 2013). The importance of both mathematics, either integrated in the children's play and preschool activities, or as an own school-based learning activity come up in public debate. It

is possible to discern the effects of these discourses in the way in which some politicians turn to stress mathematical learning when they express concern about the low quality of many preschools. As a result, the contemporary context of early years mathematics education in Sweden has evolved into a complex discursive field, which problematises the following questions: what is mathematics, what is childhood and how should mathematics be taught? (Eidevald, 2013).

The aim of this study is to investigate what discourses appear today when teachers talk about mathematics and young children, how these discourses affect the way they teach mathematics to pre-schooler and consequently who the mathematically able child is. We consider it important to explore how mathematics and children are being discussed in order to identify whether certain children run the risk of being excluded, and whether preschool education in Sweden may increase the risk of social failure for these children. Foucault's notion of discourse as a "regime of truth" along with Popkewitz's notion of "fabrication" based on Hacking are the theoretical grounding of this article to analyse teachers' narratives of early childhood mathematics in contemporary Sweden.

The paper comprises eight sections. Following the Introduction, the Early Childhood Education in Sweden is described along with the Theoretical Lenses of the study is outlined. Next, the Discursive Context of Early Years Mathematics Education is discussed before moving to The Context of the Study where the methodological procedure is noted. Then, the analysis comprises two sections, first on the Discursive Fabrication of Early Years Mathematics Education and second on the Discursive Fabrication of the Mathematical Child. Finally, some concluding remarks are made.

Early Childhood Education in Sweden: Between caring and teaching

Towards the end of the 1970s, preschool in Sweden was geared to meeting demands for

childcare within a context of a labour market and women's rights struggles. Preschool was organised according to the social needs of that time and did not develop as a primary educational institution, as it did in countries such as France and the UK (Hammarström-Lewenhagen, 2013). Conflict between various actors (e.g. politicians, teachers, policymakers and researchers) regarding the primary purpose of preschool has been part of its construction since 1900. The Ministry of Education, along with each school's administration, took on the responsibility for preschool in Sweden in 1996–1998; however, debates about the primary goals and values of early childhood education continue. The government of Sweden established the Swedish National Agency for Education to strengthen the role of language, mathematics, natural sciences and technology in the context of early childhood education in order to better prepare preschool children for school (Regeringen, 2008). This change was expressed in the revised curriculum 2010 (Lpfp 98, revised 2010) in which the goals for children's mathematical development were made much clearer in both scope and content than earlier. In parallel, the OECD proposed an assessment of early learning outcomes, as discussed in the "International early learning and child well-being study" (OECD, 2017b). The motivation for such a proposal has been argued to be a recognition of the importance of children's early learning in the realm of their well-being in society. Esping-Andersen, a well-known professor of Sociology, argued in the OECD report that: "If the race is already halfway run even before children begin school, then we clearly need to examine what happens in the earliest years" (OECD, 2017 b, p. 14).

However, the direction of Swedish preschool under the current pressure for increased formal learning contributes to educational uncertainty among teachers, who struggle with finding a balance between the three mainstays of care, education and learning. On the one hand, the focus in science and mathematics activities can be on socialization that is considered more important to the child than the subject itself (Thulin, 2011). On the other hand,

socialization is easily subordinated to certain types of formal mathematics and science learning and teaching in some preschools (Einarsdottir, Purola, Johansson, Broström, & Emilson, 2015).

During the last few years, researchers and teacher educators developed modules for the Swedish National Agency for Education that support teachers' focus on mathematics. These modules are based on Bishop's (1988) broader way of approaching mathematical activity by counting, locating, measuring, designing, playing and explaining. Curricular goals were redesigned around these basic ideas of human activities, and teachers were encouraged to organise their teaching accordingly.

Another factor influencing the call for emphasis on mathematics teaching in preschool is the value that is placed on social justice for children and their families, which is reflected in the school policy discourse from the 1970s (e.g. non-segregation values). In this policy, preschool education in Sweden is framed as a levelling factor for achieving justice and equality values. Population mobility and diversity among children and teachers characterise the current public preschool setting. The recent reforms highlight the importance attached to the inclusion of all categories of young children, including children of the unemployed and immigrants (Jönsson, Sandell & Tallberg-Broman, 2013).

Theoretical Lenses: The discursive fabrication of the subject

In this study, the concepts of "regime of truth" and "fabrication" are employed as theoretical lenses to describe our research focus in the context of early years mathematics.

We have used Foucault's (1993) discourse concept in a specific context, namely within the preschool practice that produces a certain type of belief or "regime of truth". Discourse can be found in speeches and texts within a specific context or in social and historical processes. If you follow Foucault's reasoning, you can say that there is, for example, a preschool discourse,

a mathematical discourse and a childhood discourse. When these discourses meet, a specific discourse can be produced that determines what mathematics at preschool is. Discourse is what sets the limits for what is possible to think, do and say (Foucault 1993). What one can say and do in some contexts is not possible in other contexts. For Foucault, discourses organize what knowledge is accepted in a particular group in a specific historical context. This knowledge, linked to an institution, is linked to power as it defines what is normal and not normal within this institution. When preschool teachers talk about mathematics, such as parts, concepts and methods, discourses are expressed through a common language (Foucault, 1972 in Mac Naughton, 2005). The common language is expressed in, and forms, everyday actions, but also languages in, for example, textbooks, lectures and conferences (Mac Naughton, 2005). These texts (in the broad sense) constitute a developmental discourse of the child and frame how preschool teachers can think, feel, understand and practice. Discourse on what mathematics for young children is and how it is to be taught becomes in harmony. But these texts and activities do not only develop understanding of mathematical concepts but also produce a fixed norm for communication, participation and social relations in the group (ibid). At the same time, different discourses can live side-by-side and compete or interact with each other. They are "bound to social and historical contexts" (Lentz Taguchi, 2004, p. 15). The school is the place where the population meets and where norms are created and recreated, among other things through an uninterrupted review where the children are compared and evaluated (Foucault, 1976). The norm also fabricates the abnormal; children who do not meet the school's requirements are classified as abnormal. Here, mathematics plays a special role as an inclusion and exclusion instrument. Studies often describe macro systems and the discourses produced by them, but we can study institutions that are more intimate, and study how discourses specific to the context produce ideology (Reyna & Schiller 1998, Smith, 2010). When analysing a specific context, as in this case, the fabrication of mathematics and

the mathematical child in the preschool, one can ask "what knowledge is deemed to be so legitimate that it is privileged to guide cognition and action" (Reyna & Schiller 1998, p. 337).

According to Popkewitz (2004), current discourses circulate through a variety of texts, contexts and practices, and tend to highlight mathematics as a set of skills, competences or values that will support children with coping in a changing society. Fear of an uncertain, critical and risky future is counteracted by pressing demands to regulate the present through requiring children to become both independent and responsible for their own learning and thinking processes and active participants in society as competent problem-solvers. Popkewitz (2004) argues that within such discourses, which act as "regimes of truth", mathematics is utilised not only as a tool for cognitive learning, but also ideally and ultimately as a means of moral and societal commitment.

These regimes of truth "allow for a normalisation of the population and for divided practices" (Kollosche, 2015, p. 77). As preschool teachers struggle to navigate different discourses about what mathematics is, they reconfigure their own views, beliefs and values about mathematics and early childhood. In certain historical times and contexts, specific discourses may gain more hegemony than others, and may become a prevailing "regime of truth". Therefore, it is possible to argue that the fabrication of the desired mathematical child is an effect of certain prevailing discourses in which teachers unfold their views.

Drawing on Foucault, Popkewitz (2004) extensively discusses how school mathematics becomes a distinctive part of a governmentality with a direct role in "fabricating" the mathematical child. By *fabrication*, Popkewitz means that a citizen is being created through a complex network of schooling processes that evolve through the ways in which the curriculum is enacted. However, based on Hacking's (2006) notion of "fabrication", it is explained how every governing mechanism requires the image of a different kind of person – in this case, an image of a citizen figure that did not previously exist

(also see Popkewitz, Diaz, & Kirchgasser, 2017). Thus, discourse on the relevance of mathematics for childhood development plays a key part in fabricating a certain kind of child as a citizen in direct relation to a certain kind of society (Popkewitz Diaz and Kirchgasser 2016). According to Popkewitz (2004), mathematics becomes translated within the imagination of teachers and parents through discourses on certain forms of educational psychology, which become an intellectual invention for normalising, controlling and governing a child's conduct, relationships, and communication. As such, when academic knowledge enters the school system, a sort of alchemy occurs, and mathematics becomes more than a simple cognitive task (Popkewitz, 2004). Popkewitz, Diaz and Kirchgasser (2017) states: "the alchemy of school subjects, that is, the translation of disciplinary fields of ... mathematics into pedagogical languages in making up the subjects of schooling – the child and the teacher" (p. 4). For example, teachers today talk about a child as a problem-solver or as a reflective and reasoning participant, which Popkewitz (2004) claims reflect the fabrication of a certain kind of citizen through the alchemy of scientific and mathematically oriented competencies, skills and values.

Alternative discourses are often marginalised, while ideologies of the dominant group are privileged. Although the prevailing discourses seem to reflect an intention of inclusion, they, at the same time, provoke the exclusion of those who do not meet teachers' expectations (Popkewitz, 2004). The process of fabricating the desired child as part of teaching practices results in the exclusion of those children who cannot meet the assumed norms. So-called truths tend to normalise existing relations of power over the subject(s); understanding how these truths normalise the double inclusion/exclusion process of certain groups of children can help us combat them (Mac Naughton, 2005).

The Discursive Context of Early Childhood Mathematics Education

In most studies during the past two decades, discourses in relation to early childhood mathematics education support a configuration of the child as always curious, explorative and mathematically-interested, who, under appropriate teacher guidance, develops critical and creative forms of thinking, fosters collaboration, and becomes able to consider innovative solutions (Bjorklund, 2007; Doverborg & Pramling Samuelsson, 1999; Alrø & Johnsen-Høines, 2010; Chronaki, 2011; Lembre & Meaney, 2014).

According to Walkerdine (1990), compulsory schooling has provided space for a scientific gaze upon the child. Within this space, discourses around the reasoning, rational and problem-solving child become relatively new inventions of childhood that emerge alongside formal schooling, curricula and assessment practices. When incorporated into education, such discourses become grounded in both human sciences and developmental psychology and tend to regulate the subject within the moral and societal order. Ideas from the 20th century about the reasoning child tell a story of children progressing from concrete towards abstract thinking, the latter of which is taken to be the pinnacle of a civilised being (Walkerdine, 1994). The “truth” about childhood that emerges from these theories tends to fabricate the notion of the so-called “normal child” while simultaneously framing children who cannot live up to or fit this particular image or figure as abnormal or non-normal. For example, girls have often been viewed as not competent enough to think in abstract mathematical ways, and the multilingual child has often been represented as a special variant of childhood that is mainly described as being deficient in terms of language use in the schooling language (Gitz-Johansson, 2004). Although teachers do not directly speak of ethnicity, they tend to racialise immigrant children by means of their multilingualism: the multilingual child is not perceived as a child who masters more than one language, but rather as a child who lacks competence in the state language. The discourse of the desired child comes with specific exclusions: non-desired children who are seen as deficient and disadvantaged (Norén, 2010; Palla, 2011:

Svensson, 2014). Current international research highlights the relationship between mathematical achievement, test performance and socioeconomic status, and tends to classify children into diverse types of learners (Valero & Meaney, 2014). Svensson's (2014) study highlights discussions that emphasise a lack of "Swedishness" and insufficient Swedish language skills as problems that affect immigrant students' ability to learn mathematics. Such studies attempt to create a space to hear the voices of marginalised or excluded children, and to highlight how certain discourses may hinder access for some groups of children.

Over the past two decades, an increasing number of studies on discourses in public schooling have disrupted the hegemonic discourses of development and explored how images of the desired mathematical child are constructed in teaching and teacher education, classroom teaching and learning, or curriculum reforms (Sjöberg, 2014; Valero & Knijnik, 2015; Chronaki, 2005, 2011; Kollosche, 2015; Diaz, 2017).

A number of researchers have denoted how formal practices in public schools, such as the employment of textbooks, curriculum guidelines and assessment techniques, tend to prescribe mathematics as a neutral, universal and generic terrain of knowledge that exists beyond culture, language and identity. It has been argued that mathematics becomes an easy carrier of hegemonic discourses about an inherent relation between mathematics and human development. These discourses are grounded on how childhood is conceived. Such discourses are always politically, socially and historically situated within particular agendas that are directly related to the concept of the child as a citizen (Walkerdine, 1990; Walshaw, 2004; Bright, 2016; Chronaki, 2011; Popkewitz, 2004). Taking this discursive context into account, we found it important to problematise how teachers in Sweden today fabricate mathematics education in the early years, and how they fabricate the child as a mathematically competent citizen within this context.

The Context of the Study: Methods for data collection and analysis

Interviews with ten teachers and about twenty-five hours of observations were conducted in four different preschools in southern Sweden in order to investigate how teachers discuss mathematics and children in the preschool context. Two of the four preschools are situated in small communities within the same municipality in southern Sweden. Most of the children at these two schools come from middle-class homes and have a predominantly Swedish background. The other two preschools are also located in southern Sweden, but the children at these schools live in rented apartments with their families, and most come from an immigrant background. Most of the teachers in the latter two schools also have an immigrant background, and some can speak the same languages (other than Swedish) that the children speak. All of the interviewed teachers were informed early on about what the study entailed and about issues of confidentiality (The Swedish Research Council, 2010), and consented to allow me to use the interviews, without disclosing their identities. Therefore, the data presented below uses pseudonyms.

In agreement with Deleuze's (1998, p. 64) reading of Foucault and statement that the author is not the origin of a particular discourse since a discourse is a socio-historical discursive product, our analysis does not focus on individual teachers' identities, but rather on what discourses influence their narratives. Consequently, we do not use the teachers' narrative biographies, but explore their talk about mathematics and children and how it has been influenced by prevailing discourses about early year's education in mathematics.

Since the teachers' talk revealed that a distinction between children with a Swedish background and those with an immigrant background was seen as significant, but even between the teachers' own background, we needed to denote this distinction in our analysis. However, our focus is on the ways in which categories of children are created through discursive practices and as a result of such binary oppositions. In our study, the notion of

“Swedish children” refers to children who were born in Sweden to Swedish parents; these children understand and speak the state language. The notion of “immigrant children” refers to children who were born in a foreign country but now live in Sweden, or who were born in Sweden to one or more parents who were born in a foreign country. Both terms align with definitions provided by the Swedish National Agency for Education.

Individual interviews were conducted with each teacher. In order to be flexible, and to allow the follow-up of ideas and permit supplementary questions to be asked, the interviews were semi-structured and were carried out in the form of an open, friendly discussion between the teacher and the researcher (Bryman, 2011). Our understanding of the data was based on one of the researchers’ previous experience as a multilingual preschool teacher, observations on how preschool teachers work, theoretical perspectives and prior research on teachers’ approaches to teaching mathematics to younger children. We are aware that asking questions about the kind of allowances that children with an immigrant background need in their early mathematics education may reinforce discourses on the Swedish/immigrant dichotomy.

"Categorizations may be the basis of racism but should not only be seen as something negative but also as something necessary.

"... Sometimes stereotypes are constructed to justify privileges and unequal access to social resources, but they can also be directed at the "power elite" as part of the fight for justice" (Wigerfelt, 2004 p. 24). Categorization in our study has been necessary in order to understand how the discursive desirable child is fabricated and to show how a preschool teacher with a foreign background navigates among discourses.

All interviews were transcribed and analysed as text. Findings from national and international research on early childhood mathematics education were used, and from national and international political visions and their future impact on the identities of mathematics and childhood, to analyse the data. The theoretical framework – the concept of discourse and the

regime of truth – was also used as a lens through which the interview text was analysed. The interview analysis was conducted in stages. First, words and phrases that recurred in the teachers’ description of what mathematics “is” in preschool (and what it is not) were underlined. These words or phrases to prevailing discourses for preschool mathematics in global and local contexts were linked. Similarly, phrases that were frequently used to describe the children were identified. Next, how the fabrication of school mathematics was linked to fabrications of children were traced. Finally, how discourses about early years mathematics and children become connected were analysed.

What was *unsaid* was considered to be equally important as what was *said*; by interpreting the teachers’ narratives in relation to theories, previous research or our own experiential knowledge, we were able to identify what lay “between the lines” – that is, what Foucault (1974) interprets as belonging to “the domain of subconscious knowledge” (p. 25). For example, if a teacher says that math is everywhere, then the token *everywhere* is articulated as an opposition to the tokens *nowhere* or *just in one place*. This perspective does not mean that “mathematics is everywhere” is the opposite of “mathematics is nowhere” or “mathematics is just in one place”. That articulation is just one of many that, when taken together, can provide an idea of how mathematics is articulated in preschool today. The specific worldview that is articulated through language constructs a hegemony; for example, that “mathematics is for everyone”. If another articulation limits the ability to fully take on an identity – for example, “an unsafe child cannot learn mathematics” – this sets up a struggle over who should receive priority. A hegemony cannot be articulated in relation to itself; its significance comes in relation to other discourses.

Nevertheless, we offer our interpretation, and thus are not exempt from certain influences of our times. Both authors of this paper have foreign backgrounds, and one of them worked in Swedish preschool for many years. We are aware of the risk that we may

simultaneously both produce discourses and be produced by them when we narrate “storylines” (Bagger et al., 2018; Wagner, 2017). However, our background can also help us to unpack discourses and interpret the unsaid.

Our analysis is presented in two sections. First, we discuss the discursive fabrication of early years mathematics education. Next, we discuss the young mathematical subject.

The Discursive Fabrication of Early Years Mathematics Education

In post-structuralist thought, a particular discourse can act as a “regime of truth” that establishes the limits and draws the boundaries of what can be said or done. The following quotation reflects a taken-for-granted statement about the importance of mathematics, which was shared by all (except one) of the interviewed teachers:

“It’s something they need for their future. It is required today. If you do not have math at a certain level, you cannot study for certain professions. It is required today.”
(Kajal)

These words reveal current discourses about the global importance of school mathematics as emphasised by specific OECD reports (OECD, 2014). Most teachers agreed that preschool is the first step in education. Through their talk, the teachers confirmed the discourse on the importance of preschool’s contribution to preparing mathematically able children for compulsory school. They approached this task as the need to provide all children with equal opportunities to access career paths and work prospects. One particular teacher mentioned the importance of the role the preschool teacher plays:

“We cannot sit there and wait for the children to show interest in something, but [rather] we need to get them interested. If we help them now when they are small, then they have a greater chance of learning.” (Åsa)

It is clear that teachers become part of wider cultural politics regarding schooling and educational settings, as they picture themselves as active agents preparing children for a brighter future (Montecino & Valero, 2015). Some of the teachers mentioned previous PISA test results to explain why mathematics is important in the preschool context. Thus, it can be assumed that the discourse on the importance of learning mathematics in preschool has been firmly established as a “regime of truth” and, as such, is no longer problematised.

Furthermore, although the teachers tended to confirm discourses on the importance of mathematics education in the preschool context, their ways of talking about the children differed significantly when they narrated their approaches for teaching mathematics to immigrant children versus Swedish children. The teachers working with Swedish children described how they teach children to think abstractly as part of mathematical activity, and how they challenge their ideas and strategies for doing mathematics.

“There should be questions that challenge children’s thinking and prompt their will to find out more. We have started with the abstract now because we notice that they have become skilled. ... then [after they have mastered the basics] we can move on to the abstract.” (Åsa)

The teachers described challenging Swedish children to solve problems with no concrete support. They mentioned asking children to engage in tasks with mental operations, such as addition or subtraction, while relying on mental strategies instead of using their fingers to count.

Mathematics teaching for Swedish preschool children in Sweden is still based on concrete, visual, tangible and kinaesthetic experiences. However, according to the teachers in this study, the decision to use such concrete experiences depends on whether the children are

mature or not, and understand the instructions. The teachers stated that their goal is to move quickly towards teaching mathematics at an abstract level when they teach Swedish children, who speak the state language fluently; however, when they talked about teaching immigrant children, they stated that their goal is to teach the children to speak the state language rather than understand mathematical concepts.

With Swedish children, the teachers opted to use mathematics for a higher purpose, such as teaching children to care for the environment. The children will for instance sort out the garbage in different piles, motivate their choices, argue with each other and when they all agree with the result they will carry the garbage to the waste dump. In other words, the teachers prioritised Swedish children's socialisation (here, safeguarding the environment) by using mathematics. In contrast, with immigrant children, mathematics is used to teach the children how to behave and how to use materials.

“... clarify to the children as much as possible, how an activity should go and what we should use for material and what different materials are used for.” (Karin)

As noted earlier, Popkewitz (2004) states that when academic knowledge such as mathematics enters the school system, a sort of alchemy occurs, and mathematics becomes something more than a simple cognitive task. When it is included within thematic contexts that retain societal significance, mathematics can operate as a means of safeguarding moral commitment at an ethical level. Mathematics is employed not only as a way to teach children concepts, but also (and mainly) as a way to teach them how to behave as citizens. This discourse portray mathematics education as a way of fabricating so-called “good citizens” (Persson, 1998; Walkerdine, 1998). Furthermore, they reveal how children become socialised through different channels that tend to make them citizens with different needs and qualities.

To be specific, teachers use mathematics to educate immigrant children on how to use materials in the right way and how to behave in Swedish society, whereas they use mathematics to quickly move Swedish children towards learning how to participate in handling a better world. This differentiation denotes the production and reproduction of inclusions and exclusions.

The Discursive Fabrication of the Mathematical Child

Early years education in mathematics is closely linked to the notion of the mathematical child. When analysing how the teachers referred to children, two distinct discourses were found to be simultaneously present: the deficient and the competent child. When teachers spoke about “competent” children, they often referred to Swedish children in direct comparison with immigrant children:

“We have Swedish children who are as mature as a ten-year-old, and who understand more. Yes, I don’t want to say, “know much more”, but they understand a lot more and assimilate faster than children who have different backgrounds than the Swedish children... I feel that the level [of the Swedish children] is higher. So, you are challenged more...” (Kajal, Alina)

The immigrant child is often described as being less able to understand everything in its full complexity, and this inability is always connected to a lack of full access to the state language (Gitz-Johansen, 2004). The teachers in our study also claimed that immigrant children do not understand the verbal language when the teachers try to explain tasks; as a result, the teachers must keep the lessons moving at a very slow pace and rely more on concrete experiences. When the teachers happened to speak the same (non-Swedish) language

as the children, they described translating the content, which subsequently created more opportunities to challenge the children's ideas.

In contrast, the Swedish child is perceived as already being able to perform well, at a higher abstract mathematical level and ready to impress the teacher with knowledge, skills and capacities.

“The oldest ones (5 years of age) are very talented ... we can move on to the abstract, and some of them manage it brilliantly. Surprisingly, many, in fact, manage [to understand] the abstract. It's awesome when you can see a four-year-old who can already easily think mathematically.” (Åsa)

As mentioned earlier, the ability to progress towards abstract levels of thinking is taken to be the pinnacle of a civilised being (Walkerdine, 1994). Today, abstract thinking has become a goal to strive for in preschool. The description of the competent child is always related to a description of the desired capacities that the child should master, which are framed around access to the state language and being socialised to “Swedishness” (i.e. the way of being in Swedish society):

“[They are] allowed to have an opinion – to think, dare to try, dare to guess, and the children challenge themselves and each other, and they listen to each other with respect... “ah-hah! You think this way”, then yes, it is interesting, [one thinks], “Ah-hah! So you can also think this way...” (Åsa)

Popkewitz (2004) argues that school mathematics becomes a distinctive part of governmentality and produces self-disciplined, self-regulated or self-efficient subjects through fabrication of the competent and rational problem-solver. Here, we denote how this discourse

seems to prevail in preschool education, and how it is embedded within the discourse of access to Swedish language and culture. The fabrication of mathematics as a concrete, visual and tactile subject seems to be directly connected with the notion of immigrant children; therefore, the image of the mathematically deficient child is automatically associated with the image of immigrant children and their need for concrete mathematics teaching. For example, the teacher may use a fairy tale to help children recognise different forms, but the children may learn only the *name* of the form in the state language, and gain no understanding of the concept. At the same time, the notion of abstract, challenging mathematical activity is linked with the competent Swedish child, who easily moves towards abstract thinking. One teacher described how she challenges children by asking questions without concrete support. Thus, fabrication of the mathematically able child closely depends on the discourses that make reading and writing available for that child (Walshaw, 2014). The “regime of truth” in these teachers’ narratives tends to classify preschool children into distinct groups (Valero & Meaney, 2014). Some children become fabricated as the desired child, who can think abstractly in mathematics, motivate and argue; others become classified as the deficient child, who is systematically framed as being less able or in need of continuous support. However, such teaching support proceeds at a slow pace that insufficiently challenges some of the children. Furthermore, children’s ability to think abstractly without relying on concrete support is always connected to their level of maturity, which is then connected to their access to adequate verbal skills in the state language. The discourse regarding a lack of access to “Swedishness” becomes problematic, as it encourages teachers to have lower expectations of immigrant children. Moreover, the teachers approach children’s development in the Swedish language – rather than in mathematics – as key, not only for school participation, but also for their access, integration or inclusion into society (Svensson, 2014).

Furthermore, some of the teachers who work with immigrant children described how,

before teaching mathematics, they must wait for the child to feel safe, get to know the teacher and understand how to behave. Immigrant children are described as insecure because they, or their parents, do not always understand the Swedish language and culture; the children must acclimatise before they can learn. The teachers argued that some children may have been traumatised in the past, while living in war-torn countries, and that such children can easily become victimised. The teachers insisted that they cannot teach mathematics until the children feel secure:

“This group needs security, and when security is there and we have built a good relationship, that’s when you can start to work on [mathematics]. ... yes, so first before they get the language or anything else, they need to feel safe here with us. ... then we can begin with the language, mathematics and other stuff.” (Dahlina and Alina)

The following question was: what are you doing to help the children to feel safe? And the answer was: we do activities. Our comment was: why not mathematics then?

Furthermore, a specific discourse for preschool is that mathematics is everywhere, in every activity, and at every time of day:

“... like when we start with the morning meeting, and when we share the fruit or when we first count the children – girls, boys, and then together. ... Sometimes we use bricks and build... We use nature as well...” (Kajal)

However, if mathematics is perceived as present in all activities, this discourse contradicts the one that says that insecure children should not have access to mathematics. The teachers narrated the importance of joyful, exciting mathematics education, in which

children discover mathematics in every activity and feel that mathematics is fun and accessible for all. As one teacher explained:

“We want it to be fun and stimulating and be used as a natural part of the children’s life.” (Lotta)

The teachers hoped that the children would carry this feeling with them throughout their lives. This discourse emphasises the vital role the preschool teachers see themselves as playing, as they demystify mathematics and present it as achievable and fun. First, they must prepare children to enjoy mathematics; next, they teach them how to become lifelong learners who are ready to experience a bright future that is accessible to everyone. Yet the teachers do not seem completely convinced that mathematics is easy, or that it opens up a child’s future, as they are not prepared to teach mathematics to children who are not secure enough (i.e. children who lack access to the Swedish language and culture). It is possible the teachers think that learning a certain kind of mathematics could be detrimental for immigrant children who are considered to be unready due to their peripheral integration in society or their weak mastery of the state language. However, it is interesting to note how preschool mathematics learning necessitates the mastery of both the state language and the Swedish culture for immigrant children, whereas such considerations appear to be irrelevant for Swedish children.

Concluding Remarks

Preschool teachers tend to fabricate the importance of mathematics education in direct relation to the desired child within the contemporary context of early childhood care, education and learning in Sweden (i.e. Educare), by specifically fabricating children as “Swedish children” or “immigrant children”, deciding what each child can do and adjusting

their teaching accordingly. Our analysis discusses how the discursive fabrication of mathematics education tends to happen in direct relation to the child as the desired mathematical subject, and risks excluding children who fail to conform to such configurations.

It is important to denote how this fabricating process happens between the socio-historical context of Swedish preschool and the serious global pressure for change being promoted by current comparative assessment policies. Historically, Swedish preschool prioritised the provision of a sense of security and well-being. Today, however, there is an increased emphasis on learning. In particular, the early years mathematics learning is in the spotlight today. The concern of politicians who foresee an uncertain future, and believe that the solution lies in the formation of a certain kind of citizen, becomes reflected in what happens within the preschool context. The “baby PISA” (i.e. the “International early learning and child well-being study”, OECD, 2017) is an indicator of how early mathematical skills have become influential in current discourses on the global importance of mathematics. Wasmuth (2017) is concerned that early childhood education is being reduced to certain aspects that can be easily measured: literacy and numeracy. It is well known that the OECD values and evaluates what can be measured, but not necessarily what is important for the child. “The quest for predictable outcomes leaves no place for the hallmarks of early childhood – for uncertainty, experimentation, surprise, amazement, context, subjective experiences” (Wasmuth, 2017:1). In Swedish preschool, care, socialisation and learning should form a comprehensive whole that includes and should facilitate mathematical learning for all children through play (Swedish National Agency for Education, 2010). In fact, Sweden is among the countries that have protested against the “baby PISA”, although England and the US have accepted the challenge. In the near future, there is a risk of more and more countries participating in the baby PISA, which may have the serious effect of producing

standardisation of early childhood education (Wasmuth, 2017).

It is necessary to take this complex political context into account when exploring how the teachers in this study tend to encounter discourses concerning the importance of early years mathematics education for children. The interviewed teachers mostly speak by resorting to certain prevailing discourses within the contemporary Swedish context that act as “regimes of truth” and provide them with “systems of reason” to create their own arguments about what they do with children. Such prevailing discourses are grounded, on the one hand, on societal pressure for increased performance in early mathematics for all children and, on the other hand, on issues of language and culture diversity resulting from the greater population mobility that has occurred over the last few decades. Our analysis indicates a tendency for the notion of the desired child in the context of early childhood mathematics education to envelope the notion that the “Swedish child” and the “immigrant child” are comparatively different. Moreover, these differences are being fabricated by resorting to the figure of the desired mathematical subject, who is systematically framed as having specific competencies that represent the Swedish language and culture. As such, there is a risk that the desired child is not merely the mathematically able child, but the mathematically able Swedish citizen, who is fully socialised in the state language and in the ways of living in Swedish society.

As our analysis shows, the desired mathematical child is able to think abstractly without concrete support, can reason and can push herself/himself beyond what is required in the preschool curriculum. The immigrant child is portrayed as being in need of care, support or help, and thus as a child who should not be exposed to mathematics too early. Although the teachers talk about the importance of learning more languages and incorporating related activities such as drawing, dancing, constructing and playing, it is nevertheless the mastery of the verbal codes of the state language that ultimately define who is capable of being recognised as the desired mathematical child. As such, teachers tend to expect less from

immigrant children, and view the teaching of the Swedish language as key for all children's participation, access and integration.

Furthermore, a contradiction may be identified between the discourse of mathematics being everywhere, in every activity and available for everyone, and what the teachers actually make visible for the child to see and do in practice. The goal of preschool as a levelling place is at risk of failure, and the construction of difference among children is increasing – by preparing the Swedish child to participate fully in the construction of a future society, but leaving the immigrant child behind. Through the data in this study, we see how this transition becomes somewhat smoother for the immigrant child when the teachers are also immigrants and can speak the children's home language. As a final point, it can be argued that it is necessary to identify ways that support children towards accessing mathematical concepts by taking into consideration the increased presence of diversities. Such ways may focus on how certain discursive fabrications of the desired child in early childhood mathematics education may be subverted.

References

- Alrø, H., & Johnsen-Høines, M. (2010). Critical dialogue in mathematics education. In H. Alrø, O.R. Christensen, & P. Valero (Eds.), *Critical mathematics education: Past, present and future*. (pp. 11–22). Rotterdam: Sense Publishers.
- Bishop, A. J. (1988). *Mathematical enculturation: A cultural perspective on mathematics education*. Dordrecht, Netherlands: D. Reidel Publishing Company.
- Björklund, C. (2007). *Hållpunkter för lärande: småbarns möten med matematik (Learning points for learning: Toddler meetings with mathematics)*. (Doctoral dissertation). Åbo: Åbo Akademi förlag.
- Bright, A. (2016). Education for whom? Word problems as carriers of cultural values. *Taboo:*

The Journal of Culture and Education, 15(1), 6–22.

Bryman, A. (2011). *Samhällsvetenskapliga metoder (Social science methods)*. Lund: Studentlitteratur.

Chronaki, A. (2005). Learning about “learning identities” in the school arithmetic practice: The experience of two young minority Gypsy girls in the Greek context of education. *European Journal of Psychology of Education*, 20(1), 61–74.

Chronaki, A. 2011. Disrupting development as the quality/equity discourse: Cyborgs and subalterns in school technoscience. In B. Atweh, M. Graven, W. Secada and P. Valero (eds.). *Mapping equity and quality in mathematics education*. Dordrecht. Springer, pp. 3-21.

Clements, D. & Sarama, J. (2015). Discussion from a Mathematics Education Perspective. *Mathematical Thinking and Learning*, 17: 244–252. Dahlberg, G., Moss, P., & Pence, A. (2011). *Från kvalitet till meningsskapande. Postmoderna perspektiv – exempel förskola (5:e uppl.) (From quality to meaning creation. Postmodern Perspective - Example Preschool (5th Edition))*. Stockholm: Stockholms universitets förlag

Deleuze, G. (1988). *Foucault*. Minneapolis: University of Minnesota Press.

Diaz, J. (2017). New mathematics: A tool for living the modern life, making the mathematical citizen, and the problem of disadvantage. In T.S. Popkewitz, J. Diaz, & C. Kirchgassler (Eds.), *A political sociology of educational knowledge. Studies of exclusions and difference*. New York, Routledge.

Doverborg, E., & Pramling Samuelsson, I. (1999). *Förskolebarn i matematikens värld (Preschool children in mathematics world)*. Stockholm: Liber.

Doverborg, E., & Pramling Samuelsson, I. (2011). Early mathematics in the preschool context. In N. Pramling & I. Pramling Samuelsson (Eds.), *Education encounters: Nordic studies in early childhood didactics* (pp. 37–64). New York: Springer.

- Doverborg, E., Pramling, N., & Pramling Samuelsson, I. (2013). *Att undervisa barn i förskolan (Teaching children in preschool)*. Stockholm: Liber.
- Eidevald, C. (2013). *Systematiska analyser för utvärdering och utveckling i forskola – Hallå, hur gör man? (Systematic Assays for Evaluation and Development in Research School - Hello, how are you doing?)* Stockholm: Liber AB.
- Einarsdottir, J., Puroola, A-M., Johansson, E. M., Broström, S., & Emilson, A. (2015). Democracy, caring and competence: Values perspectives in ECEC curricula in the Nordic countries. *International Journal of Early Years Education*, 23(1), 97–114.
- Esping-Anderson, G. (2004). Untying the Gordian knot of social inheritance. *Research in Social Stratification and Mobility*, 21, 115–139.
- Foucault, M. (1974). *The archaeology of knowledge*, London: Tavistock.
- Foucault, M. (1976). *Histoire de la sexualité 1. La volonté de savoir (The History of sexuality 1. The will to know)*. Paris: Gallimard.
- Foucault, M. (1980). *Power/knowledge: Selected interviews and other writings*. New York: Pantheon.
- Foucault, M. (1993). *Diskursens ordning: Installationsföreläsning vid Collège de France den 2 december 1970*. Stockholm: Brutus Östlings förlag, Symposium.
- Foucault, M. (1997). *Michel Foucault: Ethics, subjectivity, and truth*. Edited by Paul Rabinow. New York: The New Press.
- Gitz-Johansen, T. (2004). The incompetent child: Representations of bilingual children. In H. Brembeck, B. Johansson. & J. Kampmann (Eds.) *Beyond the competent child: Representations of ethnic minority children*. Roskilde: Universitetsforlag.
- Government Offices, *Department of Education, working group (U 2010: A). Promemoria*, 2010-06-24, U2010/4443/S. Electronically available 2013-02-14.
- Hacking, I. (2006). "Making up People", *London Review of Books*, Vol 28, No 16

- Hammarström-Lewenhagen, B. (2013). *Den unika möjligheten – en studie av den svenska förskolemodellen 1968 – 1998 (The unique opportunity - a study of the Swedish college model 1968 – 1998)* (Doctoral dissertation). Stockholm: Universitetservice US-AB.
- Jönsson, I., Sandell, A., & Tallberg Broman, I. (2013) Les réformes de l'éducation préscolaire (Reforms of preschool education). *Politiques sociales et familiales*, 112, 63–72, CNAF, ISSN 2107-0210.
- Kollosche, D. (2015). *Criticising with Foucault: Towards a guiding framework for socio-political studies in mathematics education*. Dordrecht: Springer Science Business Media.
- Lembrér, D., & Meaney, T. (2014). Socialisation tensions in the Swedish preschool curriculum: The case of mathematics. *Educare, Vetenskapliga Skrifter*, 2, 89–106.
- Lentz Taguchi, H. (2012). *Pedagogisk dokumentation som aktiv agent – introduktion till intraaktiv pedagogik*. Malmö: Gleerup.
- Mac Naughton, G. (2005). *Doing Foucault in early childhood studies. Applying poststructural ideas*. London: Routledge.
- Montecino, A., & Valero, P. (2015). Product and agent: Two faces of the mathematics teacher. In *Proceedings of the Eighth International Mathematics Education and Society Conference. Volume 3*, 794-806. Portland, Oregon, USA.
- Norén, E. (2010). *Flerspråkiga matematikklassrum. Diskurser i grundskolans matematikundervisning (Multilingual math classroom. Discourses in elementary school mathematics education)*. (Doctoral thesis). Stockholm: Stockholm University.
- OECD (2011). *Starting strong III. A quality toolbox for early childhood education and care*. Paris: OECD.
- OECD (2014). *PISA 2012 results in focus. What 15-year-olds know and what they can do*

- with what they know*. Paris: OECD.
- OECD (2017 a). *Starting strong. Key OECD indicators on early childhood education and care*. <http://dx.doi.org/10.1787/9789264276116-en>.
- OECD (2017 b). *Early learning matters project brochure*. Paris: OECD.
- Palla, L. (2011). *Med blicken på barnet. Om olikheter inom förskolan som diskursiv praktik (With a look at the child. About differences in preschool as discursive internship)*. Malmö: Holmbergs.
- Persson, S. (1998). *Förskolan i ett samhällsperspektiv (Preschool in a social perspective)*. Lund: Studentlitteratur.
- Popkewitz, T. S. (2004). The alchemy of the mathematics curriculum: Inscriptions and the fabrication of the child. *American Educational Research Journal*, 41(1), 3–34.
- Popkewitz, T.S., Diaz, J. & Kirchgaser, C. (2017). *A Political Sociology of Educational Knowledge. Studies of Exclusions and Difference*. New York, Routledge.
- Popkewitz, T. S., Diaz, J., & Kirchgaser, C. M. (2016). Curriculum studies and historicizing the present: The political and impracticality of practical knowledge. *Special Issue: Knowledge Cultures*, 4(2), 11–18.
- Porter, E. J. (2000). Setting aside the identity-furor: Staying her story-course of sameness. *Qualitative Inquiry*, 6(2): 238–250.
- Regeringen, (2008). Uppdrag till statens skolverk om förslag till förtydliganden i läroplanen för förskolan (Mission to the state's schoolwork on proposals for clarification in the curriculum for preschool). Stockholm: Regeringsbeslut, Utbildningsdepartementet, U2008/6144:1-6.
- Reyna, S., & Schiller, N. G. (1998). The pursuit of knowledge and regimes of truth. *Identities*, 4: 333–341.
- Roth, W. M., & Radford, L. (2011). *A cultural-historical perspective on mathematics*

- teaching and learning*. Rotterdam: Sense.
- Sheridan, S., Pramling Samuelsson, I., & Johansson, E. (2009). *Barns tidiga lärande: en tvärsnittsstudie om förskolan som miljö för barns lärande (Children's Early Learning: A cross-sectional study on preschool as an environment for children's learning)*. Göteborg: Acta Universitatis Gothoburgensis.
- Sjöberg, L. (2014) The construction of the ideal pupil – teacher training as a discursive and governing practice. *Education Inquiry*, 5:4, 23136, DOI: 10.3402/edui.v5.23136.
- Smith, K. (2010). Fostering regimes of truth: Understanding and reflecting on the Freedom School way. *Pedagogy, Culture & Society*, 18(2), 191–209.
- Svensson, P. (2014). *Elever med utländsk bakgrund berättar. Möjligheter att lära matematik. (Pupils with foreign background tells. Opportunities to learn mathematics)*. Malmö: Holmberg.
- Taguma, M., Litjens, I., & Makowiecki, K. (2012). *Quality matters in early childhood education and care*. Finland & Paris: OECD.
- The Swedish National Agency for Education (2010). *Curriculum for the Preschool*. Stockholm: Fritzes
- The Swedish Research Council (2010). *Forskningsetiska regler (Research ethics)*.
<http://www.codex.vr.se/texts/HSFR.pdf>
- Thulin, S. (2011). *Lärares tal och barns nyfikenhet. Kommunikation om naturvetenskapliga innehåll i förskolan (Teacher speech and child curiosity. Communication on science content in preschool)*. (Doctoral dissertation). Växjö: Växjö University Press.
- Valero P., & Meaney, T. (2014). Trends in researching the socioeconomic influences on mathematical achievement. *ZDM Mathematics Education*, 46, 977–986.
- Valero, P., & Knijnik, G. (2015). Governing the modern, neoliberal child through ICT research in mathematics education. *For the Learning of Mathematics*, 35(2), 34–39.

- Walkerdine, V. (1990). Difference, cognition, and mathematics education. *For the Learning of Mathematics*, 10(3), 51–56.
- Walkerdine, V. (1994). Reasoning in a post-modern age. In P. Ernest (Ed.) *Mathematics Education and Philosophy: an international perspective*. London: Falmer
- Walkerdine, V. (1998). *Counting girls out: Girls and mathematics* (new edition). London: Falmer Press.
- Walshaw, M. (2004). Pre-service mathematics teaching in the context of schools: An exploration into the constitution of identity. *Journal of Mathematics Teacher Education*, 7, 63–86.
- Walshaw, M. (2014). Who can know mathematics? *For the Learning of Mathematics*, 34(2), 2–6.
- Wasmuth, H. (2017, December 5). Baby PISA is just around the corner. So why is no one talking about it? Retrieved from <http://ecepolicyworks.com/baby-pisa-is-just-around-the-corner-so-why-is-no-one-talking-about-it/>
- Wigerfelt, A. S. (2004). Forskning och föreställningar – betydelsen av hur rasism definieras inom forskning och utredningar. I SOU 2004:48. *Rapport från Integrationspolitiska maktutredningen*. Stockholm: Elanders Gotab AB.

The Authors

Laurence Delacour

PhD candidate in Mathematics Education, Faculty of Education and Society, University of Malmö, Sweden. Tel: +4640 6658224; E-mail: Laurence.delacour@mau.se

Anna Chronaki

Professor, Faculty of Education and Society, University of Malmö, Sweden. Tel: +4640 6657445; E-mail: anna.chronaki@mau.se