What the mathematics in the puzzles and handicrafts in 1920s Danish children's magazines tells about childhoods

Authors: Troels Lange and Tamsin Meaney

Western Norway University of Applied Sciences

Abstract:

The media that adults decide is appropriate for children to engage with has always reflected societal views about appropriate childhoods. However, these views can differ. Although studies have been done on the connection between childhoods and children's media experiences, in this paper the mathematics in puzzles and handicrafts in a selection of Danish children's magazines from 1925 to 1930 is analysed. The analysis shows that there were a predominance of measuring and designing activities with children engaging in adult-equivalent tasks, such as building a hen house. These tasks had limited specific instructions, indicating that children needed to persevere in working out the details. On the whole the kind of appropriate childhoods that are presented through these tasks remain consistent across the more than five years of the publications. As well, very few distinctions are made according to gender indicating that the Danish magazine editors in the 1920s did not differentiate their expectations about appropriate childhoods. The puzzles and handicrafts indicate that appropriate childhoods were considered as those which prepared children for adulthood and which valued the importance of doing things.

Keywords: *children's magazines, childhood, 1920s, mathematical activities, gender*

MEDIA AND ADULTS' VIEWS ON APPROPRIATE CHILDHOODS

This special issue is about how news media for children is determined and the impact that this may have on their sense-making about the world. We have chosen to take a slightly different tack than the other articles in the special issue by exploring how the mathematical ideas identified in the puzzles and handicrafts included in Danish children's magazines from 1925 to 1930, reflect adults' expectations about appropriate childhoods. In so doing, we argue that current debates about the suitability of different media for children reflect discussions that have occurred since child labour was abolished and large numbers of children were recognised as having leisure time that needed to be filled in order to overcome idleness (Weinreich, 2008). For example, De Coninck-Smith (1990) noted that, at the end of the nineteenth century in Denmark, there were discussions about how to civilise children not just through schooling but also through play and sports where adults should have a guiding role. De Coninck-Smith (1990) considered that these views were based on those of Spencer (1861) who wanted children to grow up to be self-governing beings, not beings that should be governed by others. Thus, rather than consider how children make sense of the world through engaging with news media modified for them by adults, we focus on what the activities in these magazines tell us about what adults deemed to be suitable childhoods.

Although the recognition of childhood as a distinctive phase of life highlighted that children have different needs to adults, adults continue to argue over what is an appropriate childhood, not just in Denmark but also in other countries around the world. However, there is no one kind of childhood as childhood is an integral part of the social environment in which children operate. A recognition of this relationship allows for "a coherent understanding of different childhoods in different historical periods" (Hedegaard, 2009: 70). Walkerdine (2009) expressed this more strongly by stating:

> Thus, there can be no timeless truth, sociological or psychological, about childhood. There can rather be understandings of how childhood is produced at any one time and place and an imperative to understand what kinds of childhood we want to produce, if indeed we want childhood at all. (p. 117)

The media that children engage with contribute to the production of certain kinds of childhood and as such attract debate by adults in regard to their suitability. For example, Weinreich (2008) described two common viewpoints in discussions about Danish children reading books at the end of the nineteenth century:

> 1. Reading books is good; however, one should take care that it does not get out of control. Book reading can be 'dangerous' with its one-sided impact on 'the spiritual powers'. 'A child whose life is books lives in reality like a monk in his cell .... A book worm rarely has a personality full of vitality.'
>
> 2. Reading books is good, as it ensures that children spend their time wisely. If you start reading books, it will later on in life prevent you from 'running around the streets, visiting pubs, boozing, playing cards and engaging in other types of bad entertainment'. (p. 8)

Thus, engaging with books could constitute a part of Danish children's childhoods at that time and could contribute to them becoming responsible adults. However, there was a need for adults to monitor children's book reading so that growing up without a vital personality could be avoided.

Similarly at the beginning of the twentieth century, concerns were raised about the inappropriateness of Danish children watching the new media of films, with restrictions being placed on who could watch specific films from 1907 (De Coninck-Smith, 1999). At the same time, public debates appeared about the value of children, especially boys aged between 11 and 13, reading cheap books, known as story papers, featuring an American detective, Nick Carter. De Coninck-Smith (1999) quoted a teacher who wrote “In the playground they read 'Nick Carter', on the streets, in gateways and everywhere you can meet children 'lapping up' one of these disgusting books with the frightful covers” (p. 653). Concerned adults felt that films and story papers could contribute to children daydreaming, which would lead to unhealthy thoughts, including suicide. In Denmark, committees were formed to set up school libraries and teachers took an interest in offering alternatives for children to read. This would allow for children to experience more appropriate kinds of childhoods.

The alternative materials that was to lead to better kinds of childhoods included specially designed children’s magazines, such as *Børnevennen Vor Ven* and *Börnenes Ugeblad* (*The child friend Our friend* and *The children’s weekly magazine*). Each week an issue was produced, which consisted of 8-12 pages. The magazines were published by the same publisher, Chr. Erichsen and edited by the same editors, Erna Damgaard and Grønvald-Fynbo. Erichsen had been a teacher and had gone on to publish both books and magazines to support children’s reading possibilities. He began publishing children’s magazines in 1903 with these magazines gaining their final form in 1917. Most of the profits were given to funds that he set up to benefit the poor, such as "Nødlidende Lærerenkers Fond" (Destitute Widows of Teachers Fund), and in 1923 he gave his entire fortune to the Nobel Peace Prize winner, Fridtjof Nansen, to support his work with refugees from the First World War (Wikipedia's users, 2016; Tvedt et al., 2018). This is certainly a different approach to the present business of children’s magazines, in which profit is the main consideration (Buckingham and Scanlon, 2001).

The content of these two magazines were identical (Wikipedia's users, 2016) and seemed to be aimed at children between 12-15 years old. Yet, these magazines can only be considered discursive resources for forming the childhood of those who could access them. Although the price meant that they were available to a large portion of Danish children, in 1927 22% of the Danish adult population were unemployed (Hansen, 2002), suggesting that many children may have been too poor to afford these magazines. Yet, magazine reading by children was common. In a survey of 250 junior high school children in New York a decade later, only 15% had not read a magazine in the previous month. However, there was a difference along gender lines, with 7% of boys, but 21% of girls who had not read a magazine (Hicks and Hayes, 1938).

Although studies such as those mentioned earlier provide some insights into the sorts of adult-approved childhoods and contemporary disagreements about them, analysis has usually been conducted on the content in the storylines of the stories. Yet, these Danish children’s magazines also contained puzzles and suggestions for handicrafts, which also offer insights into the “good” childhoods that adults publishing and buying these magazines wanted children to have. Consequently, in this paper, we consider how identifying the mathematics in cultural practices in Danish children’s magazines from the 1920s can contribute to us understanding adults’ views on appropriate childhoods, specifically in regard to gender roles and relationship to adult activities. This research is part of a wider project aimed at comparing these findings with how digital games designed for Scandinavian children can provide information about childhood in the twenty-first century.

Taking Walkerdine (2009) as a starting point, we consider that "the social is the site for the production of discursive practices which produce the possibility of being a subject" (p. 119). The puzzles and the handicrafts provide information about the discursive practices from which Danish children at this point in time could draw understandings of themselves and how they could both be part of and affect the social environment in which they operated.

THEORETICAL FRAMEWORK

By identifying the mathematical ideas in the puzzles and handicraft tasks, it is possible to consider how they are related to the childhoods that the adults who produced and bought these magazines, seemed to present as appropriate. Joram et al. (1995) describe how analyses of this kind can shift researchers' perspectives:

> Resnick (1990) proposes that shifting from viewing literacy as a competency or ability to viewing it as a set of cultural practices that people engage in changes the focus of potential research questions to include the study of the characteristics of texts that people typically read, and how those characteristics facilitate particular forms of literate practice. A similar point can be made with respect to numeracy. (p. 347)

In their study, Joram et al. (1995) compared how numeracy was presented in children's, teenagers' and adults' magazines. Their coding scheme was based on a theoretical understanding about rational numbers, which were closely linked to school mathematics. While they recognised the importance of the cultural practices, they only focused on how the context might have supported interpreting mathematical knowledge. The results of their analysis showed that teenage magazines only provided a limited bridge between children's magazines and those of adults. Although these results could have resulted in discussions about childhoods and teenage-hoods, this was not the aim of that paper.

We, therefore, have chosen to take a different approach and focus on the doing of mathematics within cultural practices in order to increase our possibilities for making links to appropriate childhoods. We argue that this approach is similar to a discourse analysis in that we focus on what the inclusion of different mathematical ideas indicates about these cultural practices.

To do this, we have chosen to classify the puzzles and handicrafts according to Bishop's (1988a) six universal mathematical activities. These describe mathematical ideas without having to lean on school curricula (Johansson et al., 2016), something which we consider is not appropriate when investigating outside-school, cultural practices. Bishop (1988a) chose to call them mathematical activities so that the focus was on the doing and not on the content knowledge. The six activities have been used in a wide range of research, including identifying the mathematics of children's video games (Køhrsen and Misfeldt, 2015). Køhrsen and Misfeldt (2015) considered that the six activities provided opportunities to see mathematical ideas as being part of the culture in which they arose.

Bishop (1988a) provided an extensive description of the six activities in his book, which he summarised in an article from the same time:

> *Counting*. The use of a systematic way to compare and order discrete phenomena. It may involve tallying, or using objects or string to record, or special number words or names.
>
> *Locating*. Exploring one's spatial environment and conceptualising and symbolising that environment, with models, diagrams, drawings, words or other means.

Measuring. Quantifying qualities for the purposes of comparison and ordering, using objects or tokens as measuring devices with associated units or 'measure-words'.

Designing. Creating a shape or design for an object or for any part of one's spatial environment. It may involve making the object, as a 'mental template', or symbolising it in some conventionalised way.

Playing. Devising, and engaging in, games and pastimes, with more or less formalised rules that all players must abide by.

Explaining. Finding ways to account for the existence of phenomena, be they religious, animistic or scientific. (From Bishop, 1988b: 182-183)

Identifying the six activities in the puzzles and handicrafts can provide information about the discursive practices that inform what adults considered to be appropriate childhoods at that point in time. We anticipated that adults would not always be in agreement, or in agreement with the children of this time, as views about appropriate childhoods were and remain contested. However, it would be interesting to see how these disagreements manifest themselves in the puzzles and handicrafts presented in the magazines. Therefore in analysing these puzzles and handicrafts, we are interested in seeing whether views on appropriate childhoods that were being discursively constructed through these puzzles and handicrafts, changed across over the five years and if they differed according to whether the tasks were connected a particular group, such as boys or girls.

DATA

The data consisted of 4 issues of *Børnevennen Vor Ven* from January 1925 (Volume 58, Issues 1-4), a content list for the same volume and 28 issues of *Börnenes ugeblad*, from 2nd June 1927 till 13th March 1930 (Volume 11, Issue 22 to Volume 14, Issue 11). Figure 1 shows the front page of one of the magazines, illustrating that they always began with factual information about a specific topic, and an example of a page of puzzles and handicrafts. Although we recognised that many of the factual articles in the magazine also made use of mathematical ideas, we have chosen to focus only on these task pages.

In five issues, there were no task pages. In those issues with task pages, the items that were included changed from week to week. Common inclusions were: "Flittige Hænder" (Busy Hands) in 16 issues; "Lille Lises Kogebog" (Little Lise's Cook Book) (see Figure 1) in 3 issues; "Nødder" (Puzzles) in 25 issues; "Blink" (factual descriptions of some phenomena, in Figure 1 these included the apparent quadrupling of the sun at high altitudes, the length of the Danish coast, the amount of stolen South African diamonds, and number of pills consumed the English) in 3 issues; and "Den lille tryllekunstner" (The Little Magician) in 6 issues.

Figure 1: Examples of a front cover and the task page

The presentation of the puzzles and handicrafts was similar over the five years. The title for Little Lise's Cook Book (see Lille Lises Kogebog in Figure 1) included a young girl, tasting something cooking in a bowl. The recipes were of equivalent difficulty to those of adult recipes. Puzzles included word, number and geography puzzles.

Few of the explanations for the puzzles or handicrafts seemed to have been simplified for children. Like the magazines for boys in the UK at the end of the nineteenth century, which included articles on how to construct rabbit hutches and model engines (Dixon, 2001), the Danish magazines included handicraft sections about how to build toys but also what could be considered more adult structures, such as hen houses and summer cottages. At times, the handicraft sections provided sewing patterns whose instructions also resembled those for adults. The border surrounding the title for the "Flittige Hænder" (Busy Hands) sections differed depending upon whether it was a building (carpentry tools, see Figure 5) or a sewing project (a series of girls with needle and thread, see Figure 2).

ANALYSIS

The analysis consisted of several steps. The first was to list all the kinds of tasks in a table. Table 1 shows part of the table identifying the tasks in the four issues of *Børnevennen Vor Ven.* The handicraft and to a lesser extent the puzzles can be separated into those in which children made toys or worked with children's games and those in which children replicated adult-like tasks, such as cooking or producing adult artefacts.

Table 1

Listing of the kinds of tasks

Vol Issue	**Flittige hænder**	**Nødder**	**Lille Lises kogebog**	**Den lille tryllekunstner**	**Blink**
BV 58(1) 1/1/1925	En drejelig kran	Firkantet nød Rebus			
BV 58(2) 8/1/1925	Dukke Lises klædeskab	Geografisk gåde Hvor har skibet været?			
BV 58(3) 15/1/1925		Historisk-geografisk opgave Hvad drømmer lillebror om?	Karamel fromage		4-dobbelt sol Danmarks kystlinje Tyveri i diamantminer Pilleforbrug i England
BV 58(4) 22/1/1925	Et lille vinterlandskab	Billedgåde Gåde		En fiks lille kortkunst	Solformørkelser Mand vs myre Ur på Mont Blanc Løver og spidsmus

The second step was to identify connections between Bishop's (1988a) six mathematical activities and the puzzles and handicrafts. Our starting point for this was to determine what it was that children were expected to do. Consequently, we did not analyse the Blink contributions as children were expected only to read these and not to act upon them in any specific way. As well, although all the puzzles and handicrafts included some kind of explanation about what to do, we did not see these as examples of Bishop's (1988a) mathematical activity of Explaining[1] because it was not the children who were expected to explain phenomena. There were no puzzles or handicrafts where the children were explicit expected to explain their actions. However, many of the instructions were not explicit and the children would have had to reason about how to carry them out. Nevertheless, we did not consider reasoning to be equivalent to the kind of activity connected to Explaining. This means that none of the puzzles or handicrafts were categorised as involving Explaining.

Table 2 provides a description of the attributes of the puzzles and handicrafts that were classified as specific mathematical activities.

[1] Bishop's (1988a) six universal activities are identified by a capital letter

Table 2

Operationalisation of Bishop's 6 mathematical activities

Bishop's (1988a) definition of each mathematical activity	Attributes in the tasks	Example of tasks
Counting The use of a systematic way to compare and order discrete phenomena. It may involve tallying, or using objects or string to record, or special number words or names.	Identifying the relationship between discrete amounts, such as ages.	27 June 1927 Nødder: number puzzles "I and my brother are together 101 years etc." (3 linear equations with 3 variables).
Measuring Quantifying qualities for the purposes of comparison and ordering, using objects or tokens as measuring devices with associated units or 'measure-words'"	Working with amounts of materials to produce an artefact.	22nd January 1925 Flittige Hænder: A small winter landscape. Children are expected to make a model of winter landscape with different materials. Qualitative description with a few construction hints/ instructions.
Locating Exploring one's spatial environment and conceptualising and symbolising that environment, with models, diagrams, drawings, words or other means.	Interpreting drawings and descriptions to position objects correctly so that artefacts and actions can be reproduced.	9th May 1929 Den lille tryllekunstner: The magnetic glass. The trick is explained and illustrated with drawings.
Designing Creating a shape or design for an object or for any part of one's spatial environment. It may involve making the object, as a 'mental template', or symbolising it in some conventionalised way.	Following and recreating a pattern.	22nd January 1925 Draw the silhouette of a camel by enlarging a pattern.
Playing Devising, and engaging in, games and pastimes, with more	Rules connected to well-known past-times, such as word games.	1st January 1925 Nødder: From 16 letters 4 words should be made that answer 4 questions, "The first calls out its own name, the second is our

or less formalised rules that all players must abide by.		country to much benefit, the third confines loss and shipwreck, the fourth on your finger you will find".

Many of the tasks were categorised as requiring children to be involved with more than one mathematical activity. For example, many handicraft tasks which involved the children making something were classified as both Designing and Measuring. In the next section, we give an example of a puzzle or handicraft that was categorised as being connected to each of the mathematical activities.

The final stage of the analysis was to identify the kinds of appropriate childhoods that undertaking these puzzles and handicrafts seemed to suggest. Whereas identifying the mathematical activities indicated what children were expected to do, how the puzzles and handicrafts were to be undertaken provided insights into adults' views on children's independence and autonomy. For example, we categorised the tasks as either being something that only a child would engage in or something that an adult would also do. We also identified whether views about appropriate childhoods seemed to have changed over the 5 years, through changes in the puzzles and handicrafts in the magazines, and if and how distinctions were made according to gender.

EXAMPLES OF MATHEMATICAL ACTIVITIES

The tasks showed a variety of mathematical activities (Bishop, 1988a). Of the 102 tasks in the magazines, 73 were categorised as Playing because they involved the children in participating in established pastimes. Of the other mathematical activities, Designing and Measuring were most prevalent, with 27 tasks categorised as Designing and 15 as Measuring.

Counting

There were 6 tasks that were classified as Counting. Most of these were number puzzles involving children having to work out a specific amount from different clues. Some of these puzzles involved three unknown variables, making them quite challenging even for adults to solve. These puzzles were entertainment and although adults might engage in similar past times, they would be different to their work tasks.

Figure 2 shows an exception, a simple board game from 1st December, 1927. We considered that this also involved children in the mathematical activity Playing, in that the children have to follow rules. We categorised it to be Counting, as the children had to match the numbers on the dice with the number of moves along the path. On reaching particular spots, children could either advance forward or backward. This was a task, specifically designed for children, as it seemed unlikely that adults would choose to play such a simple game.

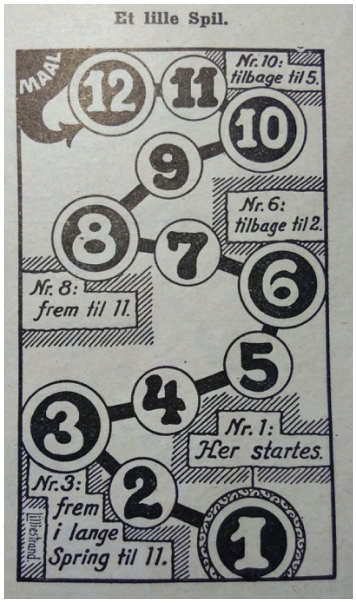
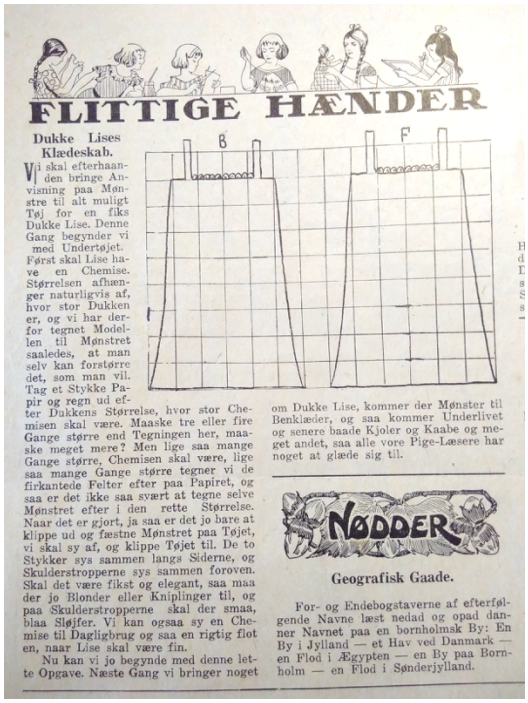


Figure 2: A board game to be played with counters and a dice

Measuring

11 out of the 15 tasks that were categorised as Measuring tasks belonged to the section Flittige Hænder. Many of these tasks were also categorised as being about Designing as the act of creating an artefact involve the children in interpreting a pattern and then creating an artefact from that pattern.



FLITTIGE HÆNDER

Dukke Lises Klædeskab.

Vi skal efterhaanden bringe Anvisning paa Mønstre til alt muligt Tøj for en fiks Dukke Lise. Denne Gang begynder vi med Undertøjet. Først skal Lise have en Chemise. Størrelsen afhænger naturligvis af, hvor stor Dukken er, og vi har derfor tegnet Modellen til Mønstret saaledes, at man selv kan forstørre det, som man vil. Tag et Stykke Papir og regn ud efter Dukkens Størrelse, hvor stor Chemisen skal være. Maaske tre eller fire Gange større end Tegningen her, maaske meget mere? Men lige saa mange Gange større, Chemisen skal være, lige saa mange Gange større tegner vi de firkantede Felter efter paa Papiret, og saa er det ikke saa svært at tegne selve Mønstret efter i den rette Størrelse. Naar det er gjort, ja saa er det jo bare at klippe ud og fæstne Mønstret paa Tøjet, vi skal sy af, og klippe Tøjet til. De to Stykker sys sammen langs Siderne, og Skulderstropperne sys sammen foroven. Skal det være fikst og elegant, saa maa der jo Blonder eller Kniplinger til, og paa Skulderstropperne skal der smaa, blaa Sløjfer. Vi kan ogsaa sy en Chemise til Dagligbrug og saa en rigtig flot en, naar Lise skal være fin.

Nu kan vi jo begynde med denne lette Opgave. Næste Gang vi bringer noget om Dukke Lise, kommer der Mønster til Benkjæder, og saa kommer Underlivet og senere baade Kjoler og Kaabe og meget andet, saa alle vore Pige-Læsere har noget at glæde sig til.

NØDDER

Geografisk Gaade.

For- og Endebogstaverne af efterfølgende Navne læst nedad og opad danner Navnet paa en bornholmsk By: En By i Jylland — et Hav ved Danmark — en Flod i Ægypten — en By paa Bornholm — en Flod i Sønderjylland.

Figure 3: A pattern for a doll's chemise

Figure 3, from 8th January, 1925, is an example of one such task. It shows a pattern for a doll's undergarment or chemise. The children had to scale each square of the pattern so that the chemise would fit their own doll. The instructions stated:

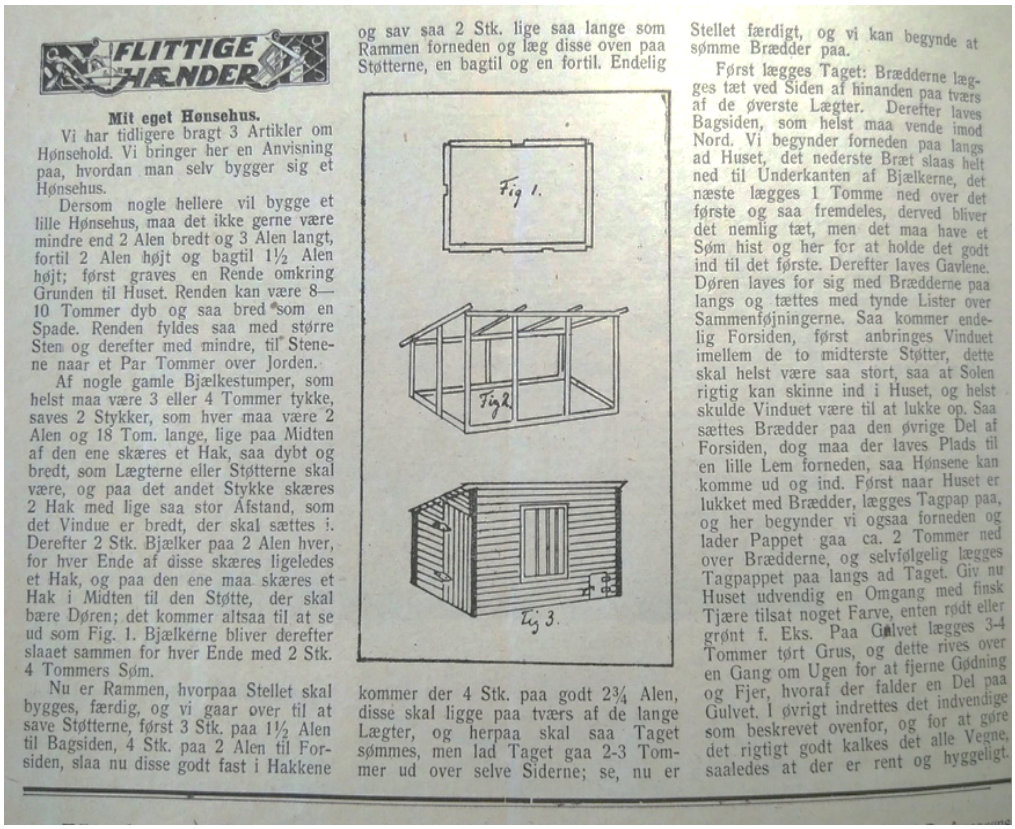
> The size, of course, depends on how big the doll is, and we have, therefore, drawn the model for the pattern so that you can enlarge it as you want. Take a piece of paper and work out from the size of the doll how big the chemise should be. Perhaps three or four times bigger than the drawing here, perhaps much more? But as many times bigger the chemise should be, we draw the square fields on the paper that many times bigger, and then it is not so difficult to draw the pattern in the right size.

The instructions provide the principles for the making the pattern but the child themselves must work out the scale factor. Although the task involved making something for a doll, it would be very similar to tasks that adults would undertake in making their own and others' clothes.

This is one of only two tasks where girls are specifically mentioned. In all other tasks, children are nominated explicitly, using expressions such as "handy children" to describe those who might want to make a model of a winter wonderland or using generic terms like "you", or no terms at all. However, sometimes as with one puzzle for "Den lille tryllekunstner", the illustrations suggest a particular gender.

Designing

Figure 4, from 8th December 1927, provides instructions for building a hen house. Like the previous handicraft task, it was classified as being about both the mathematical activities, Measuring and Designing. The numbers in the instruction indicate amounts of a particular items or distances for placing objects. As these were not about discrete amounts of something, they were not classified as Counting.



FLITTIGE HÆNDER

Mit eget Hønsehus.

Vi har tidligere bragt 3 Artikler om Hønsehold. Vi bringer her en Anvisning paa, hvordan man selv bygger sig et Hønsehus.

Dersom nogle hellere vil bygge et lille Hønsehus, maa det ikke gerne være mindre end 2 Alen bredt og 3 Alen langt, fortil 2 Alen højt og bagtil 1½ Alen højt; først graves en Rende omkring Grunden til Huset. Renden kan være 8—10 Tommer dyb og saa bred som en Spade. Renden fyldes saa med større Sten og derefter med mindre, til Stenene naar et Par Tommer over Jorden.

Af nogle gamle Bjælkestumper, som helst maa være 3 eller 4 Tommer tykke, saves 2 Stykker, som hver maa være 2 Alen og 18 Tom. lange, lige paa Midten af den ene skæres et Hak, saa dybt og bredt, som Lægterne eller Støtterne skal være, og paa det andet Stykke skæres 2 Hak med lige saa stor Afstand, som det Vindue er bredt, der skal sættes i. Derefter 2 Stk. Bjælker paa 2 Alen hver, for hver Ende af disse skæres ligeledes et Hak, og paa den ene maa skæres et Hak i Midten til den Støtte, der skal bære Døren; det kommer altsaa til at se ud som Fig. 1. Bjælkerne bliver derefter slaaet sammen for hver Ende med 2 Stk. 4 Tommers Søm.

Nu er Rammen, hvorpaa Stellet skal bygges, færdig, og vi gaar over til at save Støtterne, først 3 Stk. paa 1½ Alen til Bagsiden, 4 Stk. paa 2 Alen til Forsiden, slaa nu disse godt fast i Hakkene og sav saa 2 Stk. lige saa lange som Rammen forneden og læg disse oven paa Støtterne, en bagtil og en fortil. Endelig

Fig 1.

Fig 2.

Fig 3.

kommer der 4 Stk. paa godt 2¾ Alen, disse skal ligge paa tværs af de lange Lægter, og herpaa skal saa Taget sømmes, men lad Taget gaa 2-3 Tommer ud over selve Siderne; se, nu er Stellet færdigt, og vi kan begynde at sømme Brædder paa.

Først lægges Taget: Brædderne lægges tæt ved Siden af hinanden paa tværs af de øverste Lægter. Derefter laves Bagsiden, som helst maa vende imod Nord. Vi begynder forneden paa langs ad Huset, det nederste Bræt slaas helt ned til Underkanten af Bjælkerne, det næste lægges 1 Tomme ned over det første og saa fremdeles, derved bliver det nemlig tæt, men det maa have et Søm hist og her for at holde det godt ind til det første. Derefter laves Gavlene. Døren laves for sig med Brædderne paa langs og tættes med tynde Lister over Sammenføjningerne. Saa kommer endelig Forsiden, først anbringes Vinduet imellem de to midterste Støtter, dette skal helst være saa stort, saa at Solen rigtig kan skinne ind i Huset, og helst skulde Vinduet være til at lukke op. Saa sættes Brædder paa den øvrige Del af Forsiden, dog maa der laves Plads til en lille Lem forneden, saa Hønsene kan komme ud og ind. Først naar Huset er lukket med Brædder, lægges Tagpap paa, og her begynder vi ogsaa forneden og lader Pappet gaa ca. 2 Tommer ned over Brædderne, og selvfølgelig lægges Tagpappet paa langs ad Taget. Giv nu Huset udvendig en Omgang med finsk Tjære tilsat noget Farve, enten rødt eller grønt f. Eks. Paa Gulvet lægges 3-4 Tommer tørt Grus, og dette rives over en Gang om Ugen for at fjerne Gødning og Fjer, hvoraf der falder en Del paa Gulvet. I øvrigt indrettes det indvendige som beskrevet ovenfor, og for at gøre det rigtigt godt kalkes det alle Vegne, saaledes at der er rent og hyggeligt.

Figure 4: My own henhouse

Like the other handicraft tasks, very few explicit instructions were provided, even though this would have been a complex task even for adults. The children had to work out what they should do from the brief descriptions and pictures. Tasks such as building a hen house were tasks that adults would also engage in. The instructions have neither been simplified or made more specific because the audience is children. This suggests that children are expected to be problem solvers who can persevere with complex tasks and respond to them in adult ways.

In some tasks, the pictures were supposed to be sufficient so that written descriptions were minimalised, "the picture is so clear that no further explanation is necessary". Even so, instructions could go over several issues as was the case with the task of building a summer cottage which was spread over 3 issues. The instructions for building the hen house was only in one issue but followed earlier articles on how to look after hens. This suggests that children were expected to maintain interest in a topic over time and put together the different parts into a coherent whole.

Locating

Very few tasks were classified as being about the mathematical activity, Locating. Of the 6 tasks that were identified, 5 were to do with Den lille tryllekunstner, The Little Magician, and involved moving objects around in order to conceal and then reveal them.

Det iturevne Kort, der heles.

Man giver en af Tilskuerne et Spillekort og beder ham rive det midt over. Derefter giver man to andre Tilskuere hver en Halvdel af Kortet og lader dem halvere Halvdelene. Man kan derefter lade andre Tilskuere rive Kortet i endnu mindre Stykker, saa mange som man vil. Naar Kortet er revet i 10—15 Smaastumper, lader man en af Tilskuerne hælde alle Stumperne i Trylleæsken. Man lukker Æsken, tæller 1—2—3, aabner den, og nu er de 10—15 Smaastumper atter blevet til et helt Kort, som man tager ud og viser de forbavsede Tilskuere.

Forklaring: I Trylleæsken er Laag og selve Æsken (Underdelen) akkurat lige store og høje. Der er Hængsel udvendig paa Æskens ene Side. Indeni er Æsken malet fuldstændig kulsort. Der ligger en løs Bund (et Stykke tyndt Træ eller Pap) inden i Æsken, og denne løse Bund er kulsort paa begge Sider ligesom Æskens øvrige indre. Skal man nu udføre det Kunststykke med Kortet, jeg har skrevet om ovenfor, saa er det nødvendigt at have to Kort af samme Slags, f. Eks. to »Hjerter 5«. Det ene anbringer man, før Kunststykket begynder, uden at Tilskuerne ser det, i Æsken under den løse, sorte Bund. Det andet er det, man lader Tilskuerne rive i Stykker, og Stumperne lægges i Æsken, som vendes om, uden at Tilskuerne ser det. Paa den Maade skjules jo Stumperne af den løse, sorte Bund, og det hele Kort ligger øverst, naar Æsken atter aabnes.

Onkel Dick.

Figure 5: The broken card that is healed

Figure 5 is from 13th June, 1929 and gives instructions from Uncle Dick about how to do a card trick which involved a hidden draw in a box that allowed a broken card to magical heal itself inside the box. This trick was also categorised as Playing because it was a common past-time for children, involving a set of implicit rules around how to perform magic tricks, with a sleight of hand that could

persuade watchers that something magical had occurred. The children had to interpret the explanation about how the trick worked so that they could make their own box and place in it appropriately a complete card and broken parts of the same card so the trick would work. In so doing, they are exploring space by replicating the trick in which spatial relationships were distorted so that the broken parts of the card were hidden and the hidden whole card revealed.

Magic tricks had been particularly popular parlour games since at least the second half of the nineteenth century (Al-Gailani, 2009) and so something similar to this trick could be something that children had seen adults preform. It, thus, could be considered as a replica of an adult task, but an entertainment rather than a working task. This is perhaps reinforced by the by-line being given to an adult, Uncle Dick, which does not happen with any other kind of task. In the instructions, the child is addressed with the generic "you", "man", indicating that Uncle Dick was addressing anyone and not specifically boys.

Playing

As can be seen in the previous examples, Playing as a mathematical activity was evident in all 72 Nødder. However, being classified as Playing did not mean that the puzzles were only for children.

Figure 6 is a puzzle in which 16 match sticks have to be removed to make 5 rectangles. It is classified as Playing and Designing. Match stick puzzles were past-times that had originated as games on match boxes when match boxes were first introduced (Young, 2013).

Figure 6: The match stick puzzle

Match stick puzzles has specific rules and solution strategies. These solution strategies involve players having to produce different layouts to meet the specific requirements of the instructions. In producing the new shapes, the children were engaged in Designing as well as Playing.

However, as match stick puzzles originated in the adult world and continue to be played by adults, these puzzles would not be something just for children. Children were expected to share the past-times of adults and not just have their own puzzles that adults would not play.

CONCLUSION

The analysis indicates that the puzzles and handicrafts required children to engage with a range of mathematical activities. As Bishop (1988a) suggested, mathematical activities are integrated in cultural practices and provide extra insights into those practices. It is clear from the analyses that the way that the mathematical ideas are incorporated into the puzzles and handicrafts was very different

to that which these children would have met at school. Some number puzzles, which could be solved using linear equations, had similarities to the logic tasks that were part of Danish school mathematics teaching at this time. However, most tasks were dissimilar to the number calculations or pseudo-context problems found in textbooks of the 1920s (Hansen, 2002; Friis-Petersen and Jessen, 1930). Although textbook tasks also provide insights into the children's childhoods, our focus in this article is on the kind of childhoods that were presented as appropriate in the puzzles and handicrafts in the magazines. We consider that this kind of analysis provides similar insights to that of discourse analysis in that it connects the puzzles and handicrafts to cultural practices, in this case understandings of childhood, through the mathematical activities. Without identifying the mathematical activities it would be difficult to fully understand the potential role of the puzzles and handicrafts as discursive resources for shaping the kind of childhoods that adults considered to be appropriate.

Our findings show that there were differences in what was being presented as an appropriate childhood. The discursive resources embedded in the puzzles and handicrafts differed between suggesting that children should engage with tasks on their own terms as children and suggesting that children should be prepared for adulthood by engaging in adult or adult-like tasks. Tasks such as the board game provided the children with opportunities to engage with mathematical activities of Counting and Playing, but the game was clearly one for children and to be enjoyed on its own terms. On the other hand, building a hen house, involving Measuring and Designing, was a task that would also be undertaken by adults, with the instructions requiring adult behaviours in working out details and persevering with the complexity of the task. Other handicraft tasks presented childhoods as a mix in that making a chemise for a doll or a toy crane placed the final product in the child's world but required skills and knowledge that would be necessary for the adult world. The discursive practices that helped construct childhood at this time situate children as being capable in regard to the mathematical thinking needed for the handicraft tasks.

It is interesting to see that handicrafts that involved the mathematical activities of Measuring and Designing were connected to physical tasks of making things. These handicrafts gave immediate feedback if the children's mathematical thinking was incorrect. Childhood then could be considered as being discursively constructed as being about doing something. Only 5 of the magazines in our random selection did not contain any puzzles or handicrafts and most of these were published around Christmas and New Year, where it was perhaps expected that children would be occupied in other appropriate ways.

The distribution of puzzles and handicrafts did not change over the five years, suggesting that the differences in what was presented as appropriate childhoods, although varied, did not change over this time. It is also interesting to note that gender distinctions were not as evident as might have been expected. Most distinctions are made through drawings, which featured either a boy or a girl, with only two references in written language that connected girls to sewing. The title for Flittige Hænder when the tasks were connected to sewing also showed only girls with needles and thread. However in all of the puzzles and the woodworking tasks, there is no distinct marking of gender. All the sewing and woodworking handicrafts involved the children in Measuring and Designing tasks of similar complexity so the kinds of childhoods that were being presented as appropriate shared the traits of being about doing things and were similarly related to preparation for adult tasks. Similarly the

puzzles which were either child-orientated, such as the board game, or adult-inspired, like the match stick problem, made no distinctions in who should be solving them.

The analysis of the puzzles and handicrafts in these 1920s magazines showed that what was considered to be an appropriate childhood by adults did differ. Identifying the mathematical activities and their connections to cultural practices provides a promising way to consider current debates about childhood. Yet, it also seems that current debates about what is appropriate for children mirror past debates, suggesting that understanding the past will help us better understand the present.

ACKNOWLEDGEMENT

An earlier version of this paper was given at the 6th International Ethnomathematics Conference, held 8-12th July 2018 in Medellin, Colombia.

FUNDING

The authors received no financial support for the research, authorship, and/or publication of this article.

REFERENCES

Al-Gailani (2009) Magic, science and masculinity: marketing toy chemistry sets. *Studies in History and Philosophy of Science* 40: 372–381.

Bishop AJ (1988a) *Mathematical enculturation: A cultural perspective on mathematics education.* Dordrecht: Kluwer.

Bishop AJ (1988b) Mathematics education in its cultural context. *Educational Studies in Mathematics* 19: 179–191.

Buckingham D and Scanlon M (2001) Parental pedagogies: An analysis of british 'edutainment' magazines for young children. *Journal of Early Childhood Literacy* 1(3): 281–299.

De Coninck-Smith N (1990) Where should children play? City planning seen from knee-height: Copenhagen 1870 to 1920. *Children's Environments Quarterly* 7(4): 54–61.

De Coninck-Smith N (1999) Danger is looming here. *Paedagogica Historica* 35(3): 643–664.

Dixon D (2001) Children's magazines and science in the nineteenth century. *Victorian Periodicals Review* 34(3): 228–238.

Friis-Petersen F and Jessen JLW (1930) *Mellemskolens ny Regnebog III: 100 Regnetimer for 3. Mellemskoleklasse.* København: Jul. Gjellerups Forlag.

Hansen HC (2002) *Fra forstandens slibesten til borgerens værktøj - regning of matematik i folkets skolen 1739-1958.* Aalborg: DCN Dansk Center for Naturvidenskabsdidaktik.

Hedegaard M (2009) Children's development from a cultural–historical approach: Children's activity in everyday local settings as foundation for their development. *Mind, Culture, and Activity* 16: 64–81.

Hicks JA and Hayes M (1938) Study of the characteristics of 250 junior high school children. *Child Development* 9(2): 219–242.

Johansson ML, Lange T, Meaney T, et al. (2016) What maths do children engage with in Swedish preschools? *Mathematics Teaching* 250: 28–33.

Joram E, Resnick LB and Gabriele AJ (1995) Numeracy as cultural practice: An examination of numbers in magazines for children, teenagers, and adults. *Journal for Research in Mathematics Education* 26(4): 346–361.

Køhrsen L and Misfeldt M (2015) An ethnomathematical study of play in minecraft. In: Silfverberg H, Kärki T and Hannula MS (eds) *Nordic research in mathematics education - Proceedings of NORMA 14, Turku, June 3-6, 2014.* 205–214.

Spencer H (1861) *Education: Intellectual, moral and physical.* London: Williams and Norgate.
Tvedt KA, Iversen V and Barr S (2018, 31 July) *Fridtjof Nansen*. In *Store norske leksikon*. Retrieved 5 Dec. 2018, from https://snl.no/Fridtjof_Nansen
Walkerdine V (2009) Developmental psychology and the study of childhood. In: Kehily MJ (ed) *An introduction to childhood studies.* 2 ed. Maidenhead, UK: Open University Press, 112–123.
Weinreich T (2008) Between art and pedagogy: The history of Danish children's literature. *Bookbird: A Journal of International Children's Literature* 46(3): 5–12.
Wikipedia's users (2016, 4 August) *Chr. Erichsens Forlag*. In *Wikipedia, Den frie encyklopædi*. Retrieved 7 Dec. 2018, from https://da.wikipedia.org/w/index.php?title=Chr._Erichsens_Forlag&oldid=8666954
Young D (2013) *The 36 'Picks Puzzle*. Available at: https://www.aimsedu.org/2013/11/11/the-36-picks-puzzle/.