

# Scheduled versus demand feeding of infants: How do different feeding modes affect sleeping patterns in older childhood, and do they affect the risk of obesity

Maria Iacovou

June 2014

**Abstract** Previous research has shown that demand-feeding of infants promotes the successful establishment of breastfeeding, and that demand-feeding is also linked to better cognitive and psycho-social development among children. However, popular books promoting feeding and sleeping schedules for infants argue that such schedules promote healthy sleep into older childhood and adulthood, with associated health benefits. This research explores the validity of these claims, using data from the Avon Longitudinal Study of Parents and Children (ALSPAC) to investigate the relationship between how children were fed as infants, and their sleeping patterns at ages 9 and 11.

We find very little evidence to suggest that the incidence of sleeping problems differs between children who as babies were fed on demand or to a schedule; intriguingly, the only difference between the two groups is that children who as babies were fed on a schedule sleep for around 12 minutes longer each night than their demand-fed counterparts. While differences in sleep durations are associated with differences in the risk of obesity, we find no evidence to suggest that the shorter sleep durations of children who were demand-fed as babies are linked to an increased risk of obesity.

**Author/Speaker** Maria Iacovou is a Reader in Quantitative Sociology, Department of Sociology, University of Cambridge. Her research interests include household structures and family forms; the transition to parenthood; and infant feeding and early parenting.

**Note** ICLS hosted a policy seminar on Sleep & Health at UCL on 3 June 2014. The seminar was chaired by Richard Bartholomew, (former), Chief Research Officer, Children, Young People and Families Directorate, Department for Education and the presentations co-ordinated by Professor Amanda Sacker, Director ICLS. Transcripts from this event, including this paper, have been made available via the ICLS Occasional Paper Series. This series allows all (those who were or were not able to attend) to read an account of the presentation. Other papers in the series include:

OP13.2 Time for Bed? Sleep, health and development in the first decade of life: findings from the Millennium Cohort Study. Yvonne Kelly, UCL

OP13.3 Troubled Sleep: A cross-national study of the influence of age, health, social and psychosocial factors. Gopalakrishnan Netuveli, UEL

OP13.4 Sleep disturbance, sleep duration and mortality in British civil servants. Jessica Abell, UCL



The International Centre for Lifecourse Studies in Society and Health (ICLS) is funded by the UK Economic and Social Research Council (ESRC) ES/J019119/1 (2013 – 2017). ICLS is a multidisciplinary research centre, directed by Professor Amanda Sacker, that supports research at UCL, University of Manchester, University of East London and Örebro University Hospital Sweden.  
E: [icls@ucl.ac.uk](mailto:icls@ucl.ac.uk) W: [www.ucl.ac.uk/icls](http://www.ucl.ac.uk/icls) T: @icls\_info



# Scheduled versus demand feeding of infants: How do different feeding modes affect sleeping patterns in older childhood, and do they affect the risk of obesity

Maria Iacovou, June 2014

## SLIDE 1

*In this presentation we're going to look at sleeping patterns among very little babies, and what happens to those babies later on. In particular, we're going to look at the effects of whether or not babies are put on a schedule when they are small.*

**Scheduled versus demand feeding of infants:  
how do different feeding modes affect sleeping patterns  
in older childhood,  
and do they affect the risk of obesity?**

Maria Iacovou  
ICLS Sleep and Health Policy Seminar  
3<sup>rd</sup> June 2014



## SLIDE 2

*In this country we are a nation of book lovers, and in particular we read loads and loads of books about how to bring up your child. So the sales of parenting books are huge: several parenting books are sold for every child born and then, you know, they're probably passed around so several people read each book. This is a photograph that I took myself in my local branch of Waterstone's: this is the aisle with the books about bringing up babies. Not all of the books have information about how your baby ought to sleep – but lots and lots of them do.*



### SLIDE 3

Not all of these books say that we should train babies to sleep to a schedule. In fact they're quite evenly distributed. Some of the books say that the very worst thing that you can do with a little baby is to impose a sleeping and feeding schedule on it. There are lots of books against feeding schedules and sleep training, some of them are pictured here .

**Against sleep training:**



The many benefits of cue-feeding your baby include: breastfeeding success, healthier babies, confident mothers, convenience, trust, child's self-esteem and a healthy relationship with his own body [pp 165-166]



Beware of baby trainers!  
To a baby trainer, a baby's cry is an inconvenient habit, which must be broken... To an AP parent, a baby's cry is a language to be listened to. [p119]

Mothers not only do not need to exercise control over their babies' sucking, they ruin the process if they do. Penelope Leach, Children First

"The best feeding schedules for babies are the ones babies design themselves... Scheduled feedings designed by parents may put babies at risk for poor weight gain and dehydration..." AAP, 1998 media alert



### SLIDE 4

And of course there are many books in favour of schedules. Here are just a couple of examples, including the bestselling baby care book in the UK, the Contented Little Baby Book, by Gina Ford.

**In favour of sleep training:**



"Night sleepers make smarter children (p53)"

... an exciting infant management plan that successfully and naturally helps infants synchronize their feeding, waketime and sleep cycles"



25% of the UK market

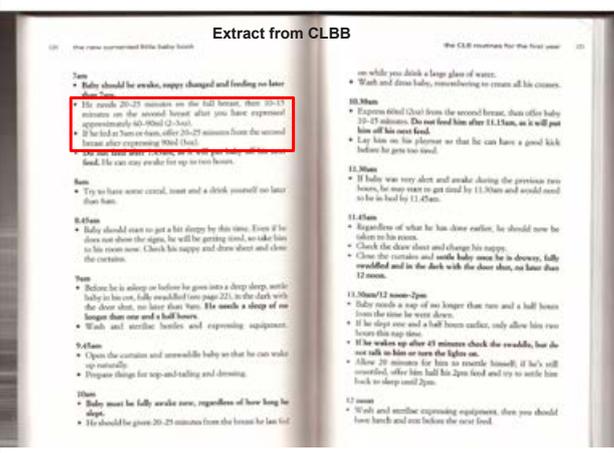
"Once you've established her routines your contented baby will... sleep through the night from an early age, and what's more, you'll be a calm and contented parent too!" [cover blurb]



### SLIDE 5

Something like every fourth parenting book that is sold in this country is written by Gina Ford, and she recommends putting babies on a schedule pretty much right from the moment they are born. Just in case you haven't heard of Gina Ford, here is an extract from one of her schedules (there are twelve different schedules in the book, that you are supposed to introduce depending on the age of the baby).

**Extract from CLBB**



10.30am  
• Express 60ml (2oz) from the second breast, then offer baby 20-25 minutes. Do not feed him after 11.15am, as it will put him off his next feed.  
• Lay him on his stomach so that he can have a good kick before he gets too tired.

11.00am  
• If baby was very alert and awake during the previous two hours, he may want to get tired by 11.00am and would need to be in bed by 11.45am.

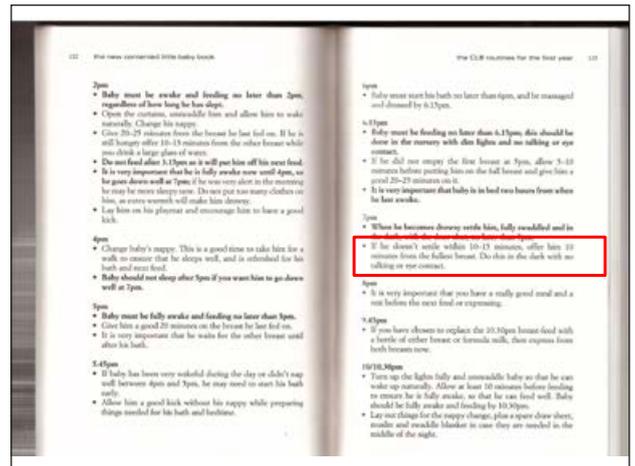
11.45am  
• Regardless of what he has done earlier, he should now be silent to his naps.  
• Check the draw sheet and change his nappies.  
• Close the curtains and settle baby once he is drowsy, fully swaddled and in the deck with the draw sheet, no later than 12 noon.

12.00am/12 noon-1pm  
• Baby needs a nap of no longer than two and a half hours into the time he went down.  
• If he sleeps one and a half hours earlier, only allow him two hours this nap time.  
• If he wakes up after 45 minutes check the swaddle, but do not talk to him or turn the light on.  
• Allow 20 minutes for him to settle himself; if he's still unsettled, offer him half his 2pm feed and try to settle him back to sleep until 2pm.

12 noon  
• Welly and settle expressing equipment, then you should have both fed and settled the next feed.

## SLIDE 6

*Anyway as you can see it's all very detailed. By the end of the page you're only at twelve noon. So you're only halfway through your day here, and then there's another page of instructions, and then finally at 10 or 10.30pm you probably collapse in a heap when you've done it all.*



## SLIDE 7

*The books I've shown you are at opposite ends of the debate, but of course there are a whole range of parenting books, very much kind of spread along a continuum really – some are closer to one end than the other, and there are also some that try to take a neutral stance and say well, you know, you're the mother, you know best. Another thing it's maybe worth pointing out about the scheduling books, which people may not know, especially if you had your babies years ago, is that these books are recommending the very early introduction of really quite prescriptive schedules. Another thing which you might be interested to know is that many of these books are written by people who have worked as maternity nurses or as nannies, not all of them have their own children and most of them are not paediatricians.*

### Notes:

- ▶ Many books recommending schedules recommend introducing them very shortly after birth
- ▶ Most schedule-feeding books are written by maternity nurses and nannies, not paediatricians

## SLIDE 8

Now, as we're talking about sleep, here is another book which is particularly relevant. This book is all about sleep, it's called *Healthy Sleep Habits, Happy Child*, by Marc Weissbluth. I'll just read this boxed highlight out to you. Well, you can read it yourself. "Warning: If your child does not learn to sleep well, he may become an incurable adult insomniac, chronically disabled from sleepiness and dependent on sleeping pills." So this book is very clearly making the point that we need to teach our babies how to sleep, to sleep regularly, right from the time when they're tiny, because otherwise that will have knock-on effects and we could end up

### Of particular relevance in this research:



Weissbluth (2005) "Warning: If your child does not learn to sleep well, he may become an incurable adult insomniac, chronically disabled from sleepiness and dependent on sleeping pills"

UNIVERSITY OF  
CAMBRIDGE

with our child being part of this epidemic of insomnia. So it's this assertion really which here I am trying to explore a little bit.

## SLIDE 9

So, what do we already know about the effects of scheduling babies? The first thing we know is that breastfeeding on demand in the early days helps get breastfeeding established successfully. Typically this research has been done in small scale studies, but it's there, it's a thing we know. In terms of other work I've done in this area, I just want to tell you about another couple of findings that relate to the scheduling of infant feeding. I'm not going to say much about them but if you want the papers I would be very happy to send them to you. Basically what these two papers are showing is that demand feeding is better for babies essentially. I won't talk about this in detail, but essentially demand fed babies, when you control for all kinds of other characteristics, have better cognitive outcomes than schedule-fed babies, with a difference that is equivalent to about four IQ points. Demand feeding is also associated with better socio-emotional outcomes among children. But the question that we're going to address now is: "Does feeding your baby to a schedule lead to better sleeping habits either in older childhood or in adulthood?" Now in fact we haven't got data on sleeping habits in

### What do we know already?

- ▶ Breastfeeding on demand helps get breastfeeding established
- ▶ Small-scale research on cue-feeding preterm babies
- ▶ Two papers based on a single large data set:
  - ▶ Demand feeding associated with better cognitive attainment (about 4 IQ points)
  - ▶ Iacovou, M. and Sevilla-Sanz, A (2013). "Infant feeding: the effects of scheduled vs. on-demand feeding on mothers' wellbeing and children's cognitive development" *European Journal of Public Health* (2013) 23(1) pp 13-19
  - ▶ And with better socio-emotional adjustment (especially for girls)
- ▶ New questions:
  - ▶ Does scheduling lead to "better" sleeping habits in older childhood (and adulthood)?
  - ▶ Might feeding mode have an effect – either directly or indirectly? – on the risk of obesity in later life?

UNIVERSITY OF  
CAMBRIDGE

adulthood in the ALSPAC dataset – but we do have data on whether the babies were fed to a schedule and how they went on to sleep as older children. The other question that we're going to address is, "Does this possibly have an effect on other outcomes that are linked to sleep duration, such as for example obesity?"

## SLIDE 10

*This slide gives some details about the data set I am using. ALSPAC is the only dataset that I'm aware of which asks this question about feeding schedules. There's another survey just coming into the pipeline, but as it stands, ALSPAC is the only child development survey that has a question on the scheduling of infant feeding.*

### Data: ALSPAC

- Avon Longitudinal Study of Parents and Children
- About 10,500 babies born in 1990 and 1991
- Based in and around Bristol
- Information from:
  - Both parents, 3x during pregnancy
  - Both parents, repeatedly over childhood
  - Weights, measures and various tests
  - Teacher assessments
  - Data from national tests



## SLIDE 11

*And this is the question that the mothers were asked at four weeks: "Is your baby fed, either by breast or bottle, on a regular schedule, e.g. every four hours?" And 7% of the mothers said yes, their babies were always fed to a schedule, 23% of the mothers said that they had tried to feed their babies to a schedule but had not pulled it off, and about 70% had fed on demand. It's interesting to note that these babies were born before Gina Ford published her first book. So the percentage feeding to a schedule now may well have changed. And possibly the demographic of schedule-feeding*

### Feeding schedules

Asked at 4 weeks:

- "Is your baby fed (either by breast or bottle) on a regular schedule (e.g. every 4 hours)?"
- "Yes, always" (7.2%)
- "Try to" (23.4%)
- "No, fed on demand" (69.4%).



*mothers may have changed as well.*

## SLIDE 12

*The survey also asked questions on sleeping at older ages. At six months and eighteen months the parents were asked, "Does your child have a regular sleep pattern?" They were also asked about sleep durations. But these answers on durations are very unreliable because when you've got a baby that little it's not constant. One day you answer a question on sleep durations and then the next day the baby starts teething or something and, it all goes to pot. At nine years and eleven years the same question comes again, "Does your child sleep regularly?", and parents are also asked to report their children's usual bedtimes and getting up times on schooldays and weekdays. And from those*

### Sleeping

- ▶ 6 months and 18 months:
  - Does child have a regular sleep pattern?
  - Daytime and night-time sleep durations [unreliable]
- ▶ 9 years and 11 years:
  - Does child sleep regularly?
  - Usual bedtimes and getting-up times on schooldays and weekends (use to calculate sleep durations)
- ▶ 9 years:
  - Information on a range of sleep difficulties



*answers we can calculate the durations of sleep on weekdays and schooldays. At nine years old, as well, the survey carries a range of information on different sleep difficulties.*

## SLIDE 13

Finally, as an indicator of obesity, the children were weighed and measured at various drop-in clinics throughout their childhood, and at ages 9, 10, and 11 they had their height and their weight measured, and from that we can calculate their body mass index.

### Obesity

- ▶ Children weighed and measured at clinics at ages 9, 10 and 11
- ▶ Calculate BMI



## SLIDE 14

So, Question 1 is: Does scheduling as a baby lead to 'better' sleep. I always put in inverted commas because you know, what is 'better' sleep? Some things we know are better and some things we think are better. But anyway, does scheduling lead to 'better' sleep?

### Q1: Does scheduling lead to "better" sleep?



## SLIDE 15

And the answer is – not really. These figures are raw associations and they're cell percentages. So these three columns are i) the group that was scheduled, ii) the group whose mothers tried to feed to a schedule but didn't, and iii) those who were demand fed. And these rows show the percentages who were sleeping regularly at six months, eighteen months, and nine years. And this row that's highlighted in red you can see that yes, babies were more likely to sleep regularly at six months if they had been scheduled earlier. But that's hardly surprising and the difference is really not that large. It's only six percentage points. However, at eighteen months and nine years the difference is absolutely tiny and it's not statistically significant at all. So, in answer to the first

### Answer: not really

	Scheduled	Tried	Demand
Regular sleeping 6 months	89.6	89.4	83.6
Regular sleeping 18 months	86.4	87.4	85.7
Regular sleeping 9 years	95.1	97.2	96.7



question, scheduling as a baby is not associated with more regular sleep as an older child. As I said, we don't have the information about later on, about sleep as an adult, but it's unlikely in my opinion that the effect would go away and then appear again in adulthood.

## SLIDE 16

In the next rows are the distributions of the sleeping difficulties that I was talking about, so these are the percentages that refuse to go to bed, for example, and on the next row are the percentages that regularly refuse to go to bed. And who would get up after going to bed, and so on and so on. And you will see that here again the differences between the groups are not very large. In a few of the cases actually it's the scheduled feeders who have more problems than the babies who were not scheduled. So in the last row, for example, waking up early, 42% of the scheduling mothers reported that, and only 34% of the demand feeding mothers reported

### Answer: not really

	Scheduled	Tried	Demand
Regular sleeping 6 months	89.6	89.4	83.6
Regular sleeping 18 months	86.4	87.4	85.7
Regular sleeping 9 years	95.1	97.2	96.7
Age 9			
Refused to go to bed	35.1	30.7	28.5
Regularly refused to go to bed	40.5	35.2	32.3
Got up after going to bed	21.9	20.7	22.7
Difficulty going to sleep	47.9	52.0	53.1
Ever wakes at night	15.8	12.9	12.5
Wakes more than once	3.6	1.8	1.7
Nightmares	25.6	30.0	28.4
Got up after a few hours sleep	7.9	6.8	5.9
Has woken very early	42.4	39.3	34.3

UNIVERSITY OF  
CAMBRIDGE

that. These are raw associations. When we control for other kind of socio-demographic and other factors, in fact, they pretty much go away.

## SLIDE 17

And with that, we've answered the question: "Is scheduling at early ages associated with better sleeping at older ages?" Well, the schedule fed babies are more likely, a bit more likely, to sleep regularly at six months but they're not more likely to sleep regularly at older ages, and indeed at age nine, the scheduled babies appear to have a few more sleeping difficulties than the demand fed babies. So no evidence there to support scheduling.

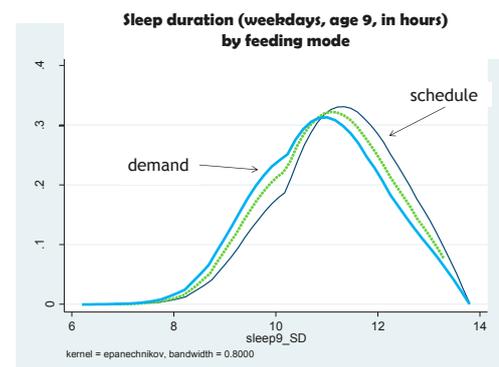
### Summary

- ▶ Schedule-fed babies are more likely to sleep regularly at 6 months
- ▶ But not at older ages
- ▶ At age 9, schedule-fed babies have slightly more sleeping difficulties
- ▶ But all these differences are small
- ▶ And most vanish after adding basic socio-demographic controls
- ▶ What about sleep durations?

UNIVERSITY OF  
CAMBRIDGE

## SLIDE 18

Things become more interesting when we start looking not at sleeping problems but at sleep durations. In this graph the sleep durations are plotted so you can see that the average is about eleven hours at age nine. The blue line is the demand fed babies, the purple line is the schedule-fed babies and the green line is the babies whose mothers tried to feed them to a schedule. And you can see that the sleep durations among the scheduled fed babies are longer. And that this effect isn't just restricted to a particular part of the distribution, it's not just that you've got more babies who go on to sleep for really long times as older children. Or it's not



UNIVERSITY OF  
CAMBRIDGE

that in the demand fed babies you've got more who go on to sleep for really short durations. It's that the whole distribution is shifted over.

## SLIDE 19

*So this is quite interesting. How big is this difference? Well, looking at the final column the difference in all cases, whether we're looking at age nine or eleven, whether we're looking at weekday or weekend durations, it's about twelve minutes. Now twelve minutes may not sound very long but it's actually about a third of a standard deviation. If you don't know what standard deviations are it doesn't matter. But it's a sizeable effect. So it's relatively small, you know, probably we adults wouldn't notice all that much if we slept for twelve minutes less than normal.*

### Scheduling and mean sleep durations (hours)

	Schedule	Tried	Demand	Dif
Weekday - 9	10.6	10.5	10.4	12 mins
Weekend - 9	10.7	10.5	10.4	13 mins
Weekday - 11	10.0	9.9	9.8	12 mins
Weekend - 11	10.5	10.3	10.3	11 mins

- Schedule-feeding parents report about 12 mins longer sleep durations
- Around 2% of average sleep duration, or 1/3 of a standard deviation
- Unexpected direction?
- Is it attributable to other characteristics associated with schedule feeding?



## SLIDES 20-21

*But the difference is there and when you control for many other things many other characteristics, I'm not going to go into this in huge detail, but the differences remain and they are statistically significant.*

### Sleep duration regressions: coefficients on "schedule-fed"

	No controls	Sex & parental education	Full controls
Weekday - 9	12 mins ***	10 mins ***	10 mins ***
Weekend - 9	13 mins ***	11 mins ***	11 mins ***
Weekday - 11	12 mins ***	10 mins ***	8 mins ***
Weekend - 11	11 mins ***	8 mins ***	8 mins ***



### Sleep duration regressions: coefficients on "schedule-fed"

	No controls	Sex & parental education	Full controls
Weekday - 9	12 mins ***	10 mins ***	10 mins ***
Weekend - 9	13 mins ***	11 mins ***	11 mins ***
Weekday - 11	12 mins ***	10 mins ***	8 mins ***
Weekend - 11	11 mins ***	8 mins ***	8 mins ***

	Full controls	Girls	Boys
Weekday - 9		8 mins ***	13 mins ***
Weekend - 9		7 mins *	17 mins ***
Weekday - 11		7 mins **	9 mins ***
Weekend - 11		10 mins ***	5 mins n/s



## SLIDE 22

*So the conclusion here is that schedule-fed children do sleep longer than demand fed children. And it's a robust result. It stays no matter what we do, statistically speaking. But is it very interesting? And the answer is well, yes, it would be interesting, if it was associated with other outcomes that we care about. So one thing that we might care about is children's cognitive development and their cognitive performance. And in another paper, which again you can ask me about if you want, I showed that within the normal range, shorter sleep durations among children are associated with somewhat better cognitive performance, which could be explained by the fact that when children are not sleeping they are doing something else. You know, they might be reading, they might just be on the Xbox or something but they might be doing something else, they might be learning.*

### Conclusions:

- ▶ Schedule-fed children sleep longer than demand-fed children
- ▶ A very robust result, but is it very interesting?
- ▶ Yes, if sleep durations are associated with other outcomes
  - ▶ In another paper, I show that shorter sleep durations, within the "normal" range, may be associated with better cognitive performance among children
  - ▶ What about the risk of obesity?
  - ▶ Chen et al (*Obesity*, 2012) show that short sleep duration is associated with increased risk of childhood obesity

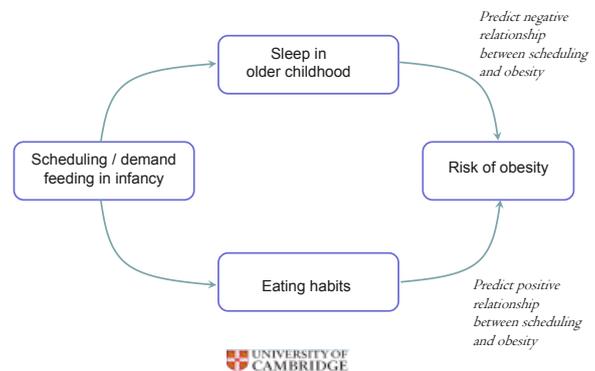
UNIVERSITY OF  
CAMBRIDGE

*Extremely short sleep durations are of course associated with really poor outcomes in a whole range of areas, among children as with adults. But across what we might think of as the normal distribution, actually shorter sleep durations among children are associated with better cognitive performance.*

## SLIDE 23

*But here we're going to look at obesity. We know that across the pretty much the entire range of sleep durations, the risk of obesity increases as sleep durations decrease. So let's look at that. Here's a diagram about how the pathways might work. If we think okay, does the mother schedule the feeds or do demand feeding in infancy, then there's two pathways by which this might contribute to the risk of obesity. One of them is by eating habits. We know that breastfed babies go on to have better eating habits in childhood and actually across the life course than bottle fed babies. The hypothesis here is that if you're breastfed you're exposed to a much wider range of tastes and sensory experiences. And also you're more able to determine how much you want to take in at any feed than a bottle fed baby. And so the same may be true of demand fed babies – being able to control when you eat as a baby may lead to better eating habits as an older child. In this case we would predict a positive relationship between scheduling and*

### Q2: is feeding mode related to a later risk of obesity?



*obesity. On the other hand we could say well, we know that demand feeding is associated with shorter sleep durations, and we know that shorter sleep durations are associated with the higher risk of obesity, so we might expect demand feeding to be linked to a higher risk of obesity. So it's actually not clear what the net relationship will be.*

## SLIDE 24

And so these are just raw associations again, no fancy statistics here, and we see that among the raw associations the scheduled fed babies have slightly higher mean body mass index, slightly higher BMIs, than demand fed babies.

### Descriptive results: Mean BMIs

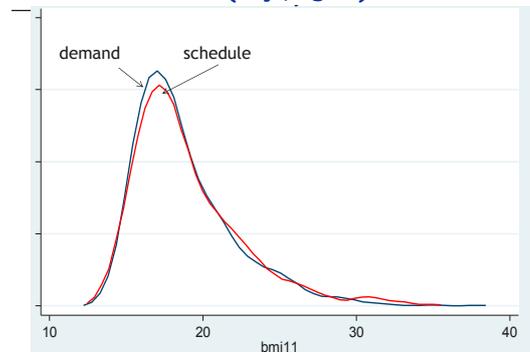
	Age 9		Age 10		Age 11	
	Boys	Girls	Boys	Girls	Boys	Girls
Schedule	17.64	18.17	18.26	18.61	19.24	19.74
Tried	17.42	17.85	18.08	18.45	18.79	19.28
Demand	17.46	17.88	18.01	18.36	18.78	19.29

UNIVERSITY OF CAMBRIDGE

## SLIDE 25

This is the distribution of BMIs by whether babies were scheduled, across the whole range. It's similar to the distribution I showed you for sleep durations, these are the demand-fed kids, these are the schedule-fed kids. And that is showing you that, the difference is there but it's really very small. It's not a big difference like we were seeing with the sleep durations, it's a little one.

### Distribution of BMI (boys, age 11)



UNIVERSITY OF CAMBRIDGE

## SLIDE 26

And in fact when you control for other things, for only a few other things, only for maternal education in fact, it goes away. There's no difference at all. So whether you were schedule-fed as a baby or demand-fed there is really no difference on your later risk of obesity. I just put a few extra coefficients here, in this slide, because I thought they were interesting. Interestingly, only children have a higher risk of obesity in later life than children with siblings. That's already known, it's not a new finding. But it's interesting, no? Breastfed children have a lower risk and those with higher sleep durations have a lower risk as well. But whether you were schedule fed as a baby has no effect whatsoever.

### Multivariate results (age 11)

Dependent variable: risk of obesity	Control only for sex and scheduling	+ maternal education	+ other controls
Schedule	0.052 *	0.033	0.008
Tried	-0.002	-0.014	-0.026
Male	-0.043 ***	-0.043 ***	-0.041 ***
Maternal education		✓	✓
Only child			0.047 **
Breastfeeding (months)			-0.013 ***
Sleep duration			-0.043 ***

UNIVERSITY OF CAMBRIDGE

## SLIDE 27

*So, just summing up then: schedule fed children have slightly higher BMIs at ages 9, 10 and 11 but really once you control for just a few things there's no effect whatsoever. So taking this as a whole and looking at what might be the policy implications, schedule feeding is associated with number one, less favourable cognitive development for children, number two, poorer scores on measures of psychosocial adjustment, and number three, there are no benefits of scheduled feeding on sleep problems, the risk of obesity or anything else. The only thing we can say is that scheduling is associated with slightly longer sleep durations in older children.*

### Results

- ▶ Schedule-fed children have slightly higher BMIs at ages 9, 10 and 11
- ▶ This difference is due to relatively small shifts in the region of the mean, and not to differences in the tails of the distribution
- ▶ Under simple multivariate analysis, controlling for parental education and social class, these differences disappear completely
- ▶ In line with other studies, sleep duration does significantly affect the risk of obesity



## SLIDE 28

*So in sum, the net evidence here is that there's really no evidence at all that routinely putting young children on a schedule is good for them. And there is evidence that it could be bad. In terms of what health professionals currently promote, most midwives and health visitors would advise new mothers, especially those who are breastfeeding, to feed on demand until breastfeeding is established. But once breastfeeding has been established they tend to be much more equivocal in their advice, possibly because there are so many books advocating scheduling. Now obviously when you're giving advice to mothers, clearly it's their decision what to do. Just like breastfeeding is better for babies – and new mothers should be given that information – but at the end of the day it's their decision what to do. In the same way, I think this research is pointing to the finding that demand-feeding is the better way to go from the point of view of the child's development, and there's no evidence that scheduling will help the child to sleep well later on. I don't think health professionals should come on strong with this and tell mothers they should be feeding on demand. But I think it would be beneficial if health practitioners did at least know about*

### Conclusions & policy implications

- ▶ Schedule feeding is associated with:
  - ▶ Less favourable cognitive development
  - ▶ Lower scores on measures of psycho-social adjustment
  - ▶ No reduction in sleep problems in older childhood
  - ▶ No difference in the risk of obesity in older childhood
  - ▶ Longer sleep durations of about 10 minutes in older childhood
- ▶ No evidence that routine scheduling at young ages is beneficial to children
- ▶ Health professionals do promote feeding on demand in the early days
- ▶ But once breastfeeding is established, may present the decision to schedule as neutral, - a matter of maternal preference
- ▶ Clearly it is for mothers to decide (as is the decision to breastfeed), but health professionals should be aware of the risks
- ▶ Support further research! Life Study; Durham University; others.



*this research and were in a position to give advice accordingly to mothers, based on the best available evidence. Of course all these findings I've just told you about are based on a single survey. We really need more research to check that they can be replicated in other surveys. As any academic will tell you, another thing we need is more research in this area, and of course investment in this research. Thanks very much.*