life at 1

how do you give a child the best chance in life?

A **STUDYGUIDE** BY MARGUERITE O'HARA AND ANDREW FILDES

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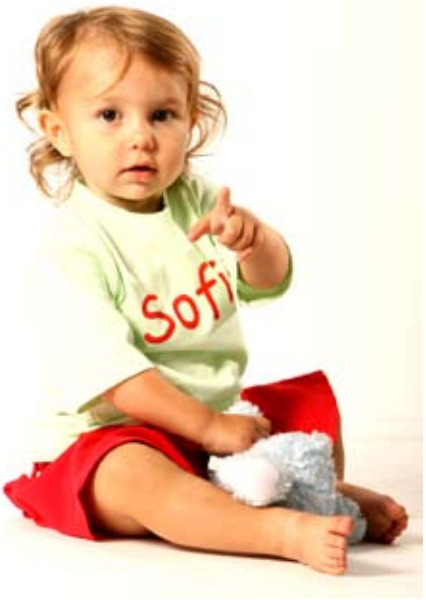
What does it take to give a child the best chance in life?



Curriculum relevance

This program will have interest and relevance for middle to senior secondary and tertiary students in the following curriculum areas:

- Biology
- Child and Family Services
- Community and Family Studies
- Exploring Early Childhood (Sec); Early Childhood Studies (Ter)
- General Science
- Health and Human Development
- Psychology
- Sociology
- Studies of Society and Environment (SOSE/HSIE)

Life at One – Episodes One and Two

This is the first instalment in a landmark series that will follow eleven babies and their families for seven years to discover what it takes to give a child the best chance in life. It is divided into two 55-minute episodes.

The filmmakers

Life at 1 is directed by Catherine Marciniak, who is also the cinematographer. The series is produced by Jennifer Cummins and narrated by Colin Friels. The series is a Film Australia National Interest Program in association with Heiress Films and it was developed and produced in association with the Australian Broadcasting Corporation.

Introduction

We were all babies once but most of us probably have little conscious memory of those first twelve months. Apart from photos and family stories, we have only the person we are now to provide us with clues about our earliest year of life. Some of us may have younger brothers and sisters whom we watched growing up and thus have a more immediate awareness of babies. This series introduces us to eleven children and their families; their parents are interviewed and the babies are observed and tested as they play and grow. The series is being made in conjunction with a longitudinal study called *Growing Up in Australia: The Longitudinal Study of Australian Children (LSAC)* being carried out by The Institute of Family Studies, which is following 10,000 Australian children over a seven year period.

Synopsis

How do you give a child the best chance in life?

Life at 1 is the first instalment in a landmark series that aims to unlock the secrets of child development by following eleven babies and their families for seven years.

Made in conjunction with the longitudinal study in which 10,000 Australian children have been placed under a sociological and scientific microscope, this groundbreaking program focuses

on those first formative years to try to discover what creates a happy, healthy child and makes us who we are.

Like those in the study, the eleven families in this series come from different walks of life. The challenges they face are both ordinary and extraordinary.

As we follow the babies through milestone events and days of ordinary routine, we witness the impact on their lives of factors such as their parents' relationships, finances, work, health and education. We watch the fascinating interplay of nature and nurture. And we predict the future.

Our experts, families and the information collected by the largest study ever conducted on Australian children tell us both what limits children's growth and wellbeing and what makes them thrive. In *Life at 1* we also conduct behavioural and biological experiments – with rather surprising results. We discover the personalities of our babies and we find out if the stresses of modern life are too much for a child.

Apart from its direct relevance to the learning areas outlined on the previous page, *Life at 1* paints a fascinating picture of Australian society in all its diversity. The series is as fundamental to understanding the nature of human life and development as *Planet Earth* is to our understanding of the natural world. This is reality television at its best. The joys and struggles of these very different families are shown with sensitivity and warmth. Comparisons with Michael Apted's *Seven Up* films are inevitable, but this series looks at children from birth to seven and employs a more deliberately scientific approach.

The film has received a PG classification from the OFLC with the consumer advice: mild themes.

Background information

1. How the series came about, the background and rationale for the large scale longitudinal study and how the families were chosen.

The Longitudinal Study of Australian Children (LSAC) was initiated by the Australian Government Department of Family and Community Services as part of the 'Stronger Families and Communities Strategy'. The Australian Institute of Family Studies is responsible for the design and management of the study. During 2004, 10,000 children and their families were recruited to the study from a sample selected from the Health Insurance Commissioner's Medicare database. About 300 postcodes were selected at random across the country and then a number of children were selected from these. Around 18,800 families in total were sent an invitation to participate.

Six design teams are researching the areas of health, education, childcare, family functioning, child functioning and socio-demographics in the lives of the 10,000 children and their families. They include sociologists, educationalists, paediatricians, psychologists, statisticians, epidemiologists and experts in early childhood, temperament and mental health of populations. There is also a Scientific and Policy Advisory Group of international experts on child development.

The first phase of the study commenced in March 2004 with the analysis of the data from this first wave released in May 2005. A 'between waves' questionnaire was sent to the 10,000 families in May 2005 and analysis of this update data was due for release in August 2006.

The second full wave of data collection commenced in March 2006 and LSAC expects to release early analysis in August 2007.

**The above information is taken from the Longitudinal Study of Australian Children 2004 annual report and advice from the Australian Institute of Family Studies.*

2. How representative of Australian society are the eleven families in the documentary and how do these families mirror the families in the major study?

We selected families that not only mirrored the lives and experiences of the 10,000 families in the Longitudinal Study of Australian Children (LSAC), but also reflected the major findings in the first wave of information collected by this landmark study.

For example, Declan represents the thirty per cent of children in the study who attend a childcare centre before they are one year old. And Anastasija represents the thirty-five per cent of children whose parents and grandparents juggle childcare around work commitments. Sofia is the child who mirrors the rising

trend in upper middle class families to use an in-home nanny. Wyatt represents the children who have a mix of carers – grandparents, formal childcare and parents – and who are going from one carer to another at least five days a week.

We were also looking for children growing up in a mix of family types: Lots of brothers and sisters as in Jara'na and Ben's stories; single children like Loulou, Anastasija, Haleema and Declan; a child with step-brothers and sisters as Shine has; small families – as for Joshua, Sofia and Daniel and the child of teenage parents like Wyatt.

To reflect the growing trend of older mothers, we wanted a range of ages in our mums. And within all of this mix we were after a diversity of economic and cultural backgrounds – always trying to reflect the spread in the 10,000 families.

(Jennifer Cummins, Producer of *Life at 1*)

3. How were the families recruited?

We made up flyers and leaflets and we put them up at baby health clinics, in preschools, at Centrelink, we advertised in baby magazines and online groups. We accessed outback Australia through some of the parenting support groups out there. We approached disability groups; we used a lot of community organizations to get the word out. When you put out for volunteers for something like this there are certain groups that generally won't respond because they've got too much on their plate – like teenage parents for instance, or the types of families that publicity doesn't access.

So we've got a few families we actually sought out.

(Jennifer Cummins, Producer of *Life at 1*)

4. Who are the experts featured in Life at 1*?*

Professor Stephen Zubrick – Chair, Advisory Group of the Longitudinal Study of Australian Children

Associate Professor Ann Sanson – Principal Scientific Advisor to the Longitudinal Study of Australian Children

Associate Professor Melissa Wake – Paediatric Consultant to the Longitudinal Study of Australian Children

Associate Professor Margaret Sims – Children and Family Studies, Edith Cowan University

5. How demanding is the making of the series on the families? Frequently Asked Questions (FAQs) and the filmmakers' answers.

• Were the families paid to be part of the series?

No … they could see how they and their children could play an important role in us understanding more about our kids. There is also an element of them doing this out of the goodness of their hearts.

(Jennifer Cummins, Producer of *Life at 1*)

> How intrusive is the research and filming process?

We said that we would probably be filming each family for three to four days to start with … but for some we needed to take more time.

We were quite rigorous about making sure people were potentially in for the long haul.

(Catherine Marciniak, Director and Jennifer Cummins, Producer of *Life at 1*)

> What happened when all the families met for the first time?

There was a huge curiosity amongst all of them … Some of the families felt they were a little bit token – the token inner-city family, the token rural family or IVF or teenage, but when they got there they realized that everybody was 'token' and was there to represent a broad spectrum of Australia.

(Catherine Marciniak, Director of *Life at 1*)

What's new about the experiments in *Life at 1*?

The science in *Life at 1* is innovative not only for television, but also in the scientific world.

In Episode One, the personality experiments scary robot and stranger encounter are classic tools used to observe the temperament of a child. But in *Life at 1*, the analysis by expert, Associate Professor Ann Sanson, is based on more than just observation. She draws on a combination of the experiment, the parents' responses to the temperament questions in the longitudinal study and data from the 10,000 children.

In Episode Two, the cortisol tests are cutting edge science. Previous cortisol testing of children has been done only in what are classed as extraordinary situations: for example, children in

childcare centres, orphanages or – like the 9/11 pregnant mothers study cited in the program – children born after traumatic events.

We are looking at how children react to normal events in a child's life: how they respond when mum goes back to work, or when they go from one carer to another; if a precious IVF 'miracle baby' is stressed by the high expectations of her mother; if infants can pick up when their parents are worried about money; and how the most vulnerable quintuplet fares compared to his siblings.

There is very little baseline data on stress and infants anywhere in the world. We now have results from the eleven families in *Life at 1* to which we can refer over the coming years.

These case studies have the potential to provide some incredibly valuable information about the physiological and psychological effects of the stresses of modern life on the development of the growing child.

Cortisol testing

Cortisol is a hormone excreted by the adrenal gland. It is believed to be a key indicator of changes in stress levels and is essential to help manage stress. It helps the body stay alert and more prepared for obstacles it may face. So it is important to understand that the presence of cortisol in saliva or blood is not in itself a problem. What is being tested here by scientists is how cortisol levels change over a day and in what circumstances. Generally they are highest in the morning when we wake up and lowest at night when we are ready to sleep. Most people, including the babies in this study, experience peaks and troughs during the day; however scientists are interested in monitoring these changes to see if they are reliable predictors of stress levels and changing behaviours, as the children grow up.

(More detailed information about cortisol testing is provided in the section on Episode Two.)

Episode One

Who are the babies and their families?

In Episode One we meet:

Loulou and her parents, Louise and Shannon

Anastasija and her parents, Kathy and Darren

Ben, one of quintuplets, and his parents, Kylie and Paul

Haleema and her parents, Battena and Bilal

Jara'na and his parents, Michelle and Paul

Student activity 1

• Before watching *Life at 1*:

1. What information do you have in the form of photos, video film and family stories about your first year of life?

2. How many brothers and sisters do you have, and what number are you in the family order?

3. Have you thought about having children in the future or do you think that you may not want them in your life?

4. If you were to have children, what do you think would be the most appropriate age to become a parent?

5. What would you like to do before you think about having children?

6. How important is it to establish a stable emotional and financial environment in which to have a child?

7. Describe any experiences you have had looking after young children, whether siblings, other relatives or through babysitting.

• Suggested ways to watch the film

Five babies and their families are featured in Episode One. Divide your class into five groups, with each group concentrating their attention on one of the children - Loulou, Anastasija, Ben, Haleema and Jara'na - and their parents.

For each child allocate specific issues on which to focus:

1. Conception and birth

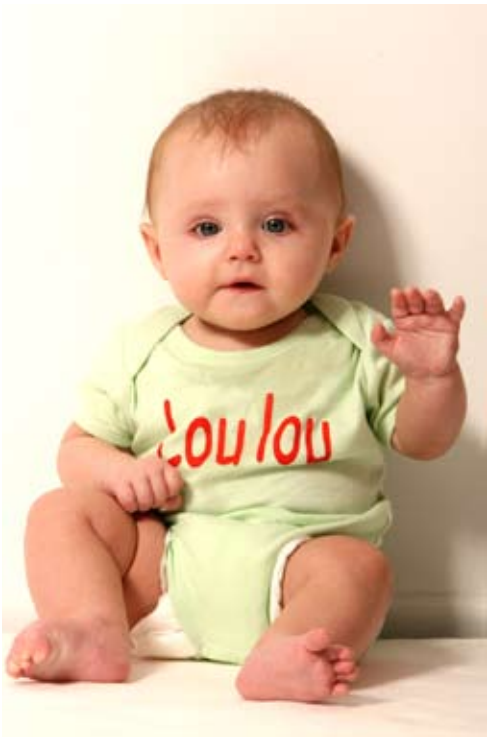
2. Economic position of the parents and family structure

3. The child's response to both the 'scary robot' and the 'stranger encounter' experiment and how the researchers make predictions about each child from these experiments

4. The minding arrangements for the child in its first year of life, including the child's connections with other adults in its world

5. General impressions of the child's personality and potential.

In the next section of the teachers' notes there are five sets of questions specific to each child. Each group should make brief notes on these questions about their chosen child as they watch the episode and afterwards all the groups can pool their information.



Student activity 2

• Watching Episode One

As you respond to the following questions about your chosen child, consider some of the specific challenges faced by the parents of each of the five children. Observe how they respond to these challenges.

(1) Loulou

I think it's a whole new adventure that neither of us have ever experienced before.
(Shannon, Loulou's father)

1. How long has Louise been trying to conceive?
2. What difficulties has she encountered?
3. How was Loulou conceived?
4. What is the statistical chance for women over forty carrying a baby to full term?
5. What are Shannon's worries about having a baby?
6. How does he describe his feelings after Loulou's birth?
7. What are the difficulties Louise has with feeding Loulou?
8. How does she feel about this situation?
9. What are the statistics about breastfeeding revealed in the study?
10. Why is breastfeeding believed to be important for babies in their first year of life?

(2) Anastasija

One of us or both of us have got to be in control and know exactly where we're going.
(Darren, Anastasija's father)

1. What jobs do Darren and Kathy have and what hours does each parent work?
2. How do they organize the care of Anastasija?
3. In the The Longitudinal Study of Australian Children what percentage of mothers were back working by the time their baby was a year old?
4. What part do grandparents, such as Anastasija's, take in minding their grandchildren?
5. Describe what happens at Anastasija's christening.
6. How does the program suggest this behaviour can be understood in relation to Anastasija's family life?
7. Explain what the purpose of the 'scary robot' experiment is and why it might be frightening for children.
8. How does Anastasija react to the scary robot and what do the researcher's conclude from this about her level of security?
9. What kind of child does Anastasija seem to be in her responses to the outside world and new experiences?

(3) Ben

I think he'll show everyone … little runt turns out to be the leader of the pack. (Loretta, Ben's grandmother)

1. What is special about the circumstances of Ben's birth and his first few months of life?
2. How small was Ben at birth?
3. What percentage of women undergoing hormone injections as part of fertility treatment is likely to have a multiple birth?
4. What are the dangers to both mother and child of this kind of multiple birth situation?
5. What sorts of problems do the researchers believe premature babies are more at risk of developing later in life?
6. Describe how Ben behaves in the stranger encounter experiment.
7. Why does he seem to be less anxious during the scary robot experiment?
8. What sort of environment has Ben's family created at home that offers him a lot of stimulation?
9. How was Ben's close tie with his grandmother initially formed?
10. On what evidence do the researchers predict that Ben is likely to be more of an introvert than an extrovert?

(4) Haleema

She's a little bit like me in the sense that she doesn't get comfortable with a certain situation until she's there for a while. (Battena, Haleema's mother)

1. What are Haleema's parents' hopes for her?
2. How old are her parents and what is their religion?
3. What daily activities are they both involved in?
4. How does Battena think her style of dress, religious affiliation and the events of 9/11 and afterwards might affect her daughter as she grows up?
5. How do Bilal and Battena describe their own personalities?
6. Describe how Haleema plays with the other children at playgroup. Does she appear to be a very shy child?
7. How does Battena respond to Haleema during her interaction with other children at the playgroup?
8. How does Haleema respond during the stranger encounter experiment?
9. What do the researchers believe will be Haleema's major challenge as she grows older?

(5) Jara'na

He'll probably have a go at most things … pretty happy and relaxed, a confident young person … probably a little bit cheeky and adventurous and a bit on the hypo side. (Michelle and Paul, Jara'na's parents)

1. How many older children are there in Jara'na's family?
2. Did his parents plan on a large family?
3. At fourteen months what are Jara'na's motor skills like?
4. What arrangements are in place for child minding in Jara'na's home situation?
5. What age gap is there between Jara'na and the other children in the family?
6. What kind of attention does Jara'na get from his siblings?
7. Describe his response to the scary robot. What does this suggest about Jara'na?
8. How is his outgoing, confident personality shown in the stranger encounter experiment?
9. What difficulties does Michelle, Jara'na's mother, anticipate he may face as he grows older?
10. How was she treated at school as an Indigenous Australian?
11. Describe the expectations Michelle and Paul have for all their children, including Jara'na.

Student activity 3

• Class discussion

Three issues are common to several families in Episode One – breastfeeding, child minding and the role of fathers in parenting.

Conduct a class discussion based on these issues using the following examples:

Breastfeeding and child minding

- Discuss how the program presents these two crucial issues for babies and their parents in Episode One.
- How does the evidence from these families tie in with the research results from the main study?

Fathers

1. *How involved in day-to-day aspects of parenting are the children's fathers?*
2. *Do you think their level of involvement accurately reflects that of the general population?*
3. *What do the results from the larger study show about time fathers spend with their children?*

- How closely did you watch this program?

Quick Quiz about Episode 1

1. Which child has the most brothers and sisters?
2. Whose father is a fireman?
3. How many of the five children are only children?
4. Whose mother is forty-three years old?
5. Which baby cries throughout the christening service?
6. Which babies are looked after quite frequently by their grandmothers?
7. Which baby had a 'one in a million' chance of being born?
8. Who hopes their baby might be Prime Minister one day?
9. Who tries to get out the door in the 'stranger encounter' experiment?
10. Which baby is most curious about the 'scary robot'?

(Answers on the last page of the notes)

Episode Two

Who are the babies and their families?

In Episode Two the focus is on the remaining six of the eleven children and their families featured in the series. This episode examines the effects of stress on children's development, particularly the relationship between parental stresses and the children's cortisol levels. We are shown how this can be both observed in behavioural terms and measured through regular cortisol testing of saliva.

In Episode Two we meet:

Shine and her parents, Michelle and Alain
Declan and his parents, Kim and Patrick
Sofia and her parents, Bernadette and Anthony
Daniel and his parents, Kathryn and Rodney
Joshua and his parents, Steffi and Garry
Wyatt and his parents, Tamara and Glenn

Student activity 4

- Suggested ways to watch the film

Six babies and their families are featured in this second episode. Divide your class into six groups, with each group concentrating their attention on one of the children – Shine, Declan, Sofia, Daniel, Joshua and Wyatt – and their parents.

For each child allocate specific issues on which to focus, as in Episode One:

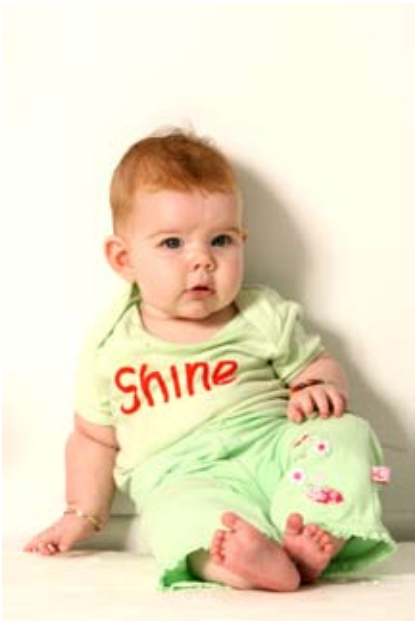
1. *Conception and birth*
2. *Economic position of the parents and family structure*
3. *How the child's stress levels are monitored in the cortisol testing experiment and what sort of predictions the researchers make about each child from these results*
4. *The minding arrangements for the child in its first year of life, including the child's connections with other adults in its world*
5. *How the child appears to be responding to stresses experienced within the family, both behaviourally and from the results of the cortisol testing.*

In the next section of the teachers' notes there are six sets of questions specific to each child. Each group should make brief notes on these questions about their chosen child as they watch this episode and afterwards all the groups can pool their information.

Student activity 5

- Watching Episode Two

As you respond to the following questions about your chosen child, consider some of the challenges faced by the parents of each of the six children. Observe how the parents and children respond to these challenges.



(1) Shine

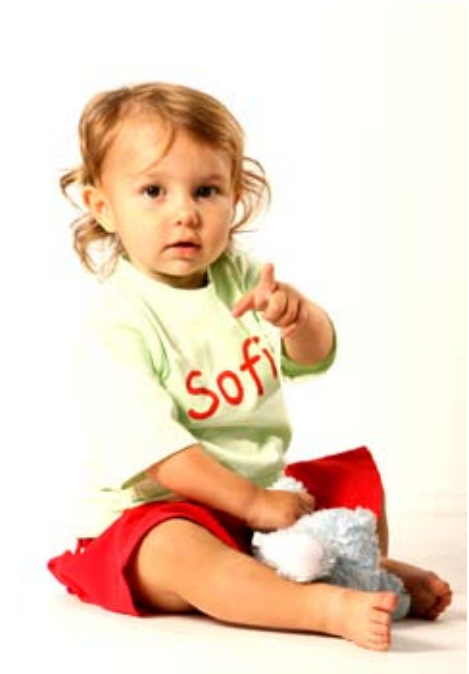
I think this baby's so lucky. I think about it and from where my other kids started off to where this baby's starting … it's getting a good start. Two loving parents, lots of kids don't have that.
(Michelle, Shine's mother)

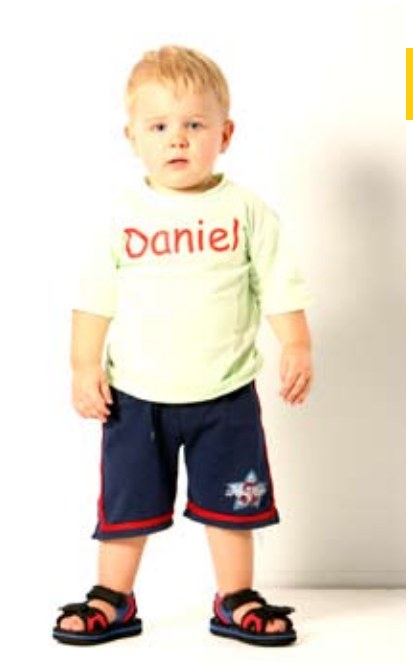
1. How many children did Michelle have before Shine was born?
2. What difficulties is Shine's father, Alain, facing with his work?
3. How has his personal situation changed in the two years since he has been with Michelle?
4. What effect does looming financial insecurity have on Michelle?
5. Why do Michelle and Alain consider their current accommodation to be unsuitable for a family with young children?
6. Why is the birth of Shine so emotional and important for Alain?
7. What difficult situation happens to the family when Shine is five months old?
8. How does Alain feel when he attends job interviews?
9. Prior to meeting Alain, what sort of difficult life situations has Michelle been through?
10. How do you think the family appears to respond to the stresses in their daily life?

(2) Declan

There's no point in me being a stay-at-home mum that's so stressed about every time you go to the checkout of the supermarket you're not sure if there's enough money in your account to cover that week's groceries. (Kim, Declan's mother)

1. Why does Kim decide to go back to work and leave Declan in day care?
2. How often is Declan in day care?
3. How does Declan and his mother initially cope with the separation in the days when he is in day care?
4. In the *The Longitudinal Study of Australian Children* what percentage of mothers were back working by the time their baby was a year old?
5. What does Kim feel she is missing out on in Declan's life by having him in day care?
6. How do Declan's cortisol levels change relative to other children in the study?
7. How do the researchers interpret Declan's cortisol levels?
8. When are Kim's cortisol levels highest?
9. How does Declan seem to be responding to day care at this stage in his development?





(3) Sofia

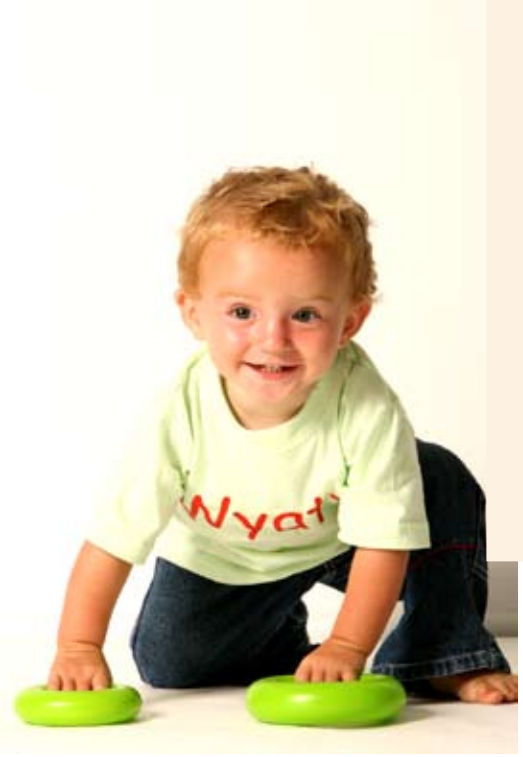
Part of me's thinking 'should I or shouldn't I [return to work as a flight attendant]?' But I'm excited at the same time because I love my job. So I think it's really important for me to have that escape.
(Bernadette, Sofia's mother)

1. What happened to Sofia's father, Anthony, two months before she was born?
2. What was his prognosis?
3. What impact did this situation have on the first three months of Sofia's life?
4. Now that Sofia is thirteen months old, what is about to change in her life?
5. How is Sofia's, and her older brother Oscar's care going to be organized now?
6. Describe Anthony's work schedule.
7. What do we see and hear in the program that indicates Anthony's level of commitment to his work?
8. How does Sofia respond to the nanny as her principal carer in the absence of her mother?
9. What pattern is shown in Sofia's cortisol levels?
10. What do the researchers speculate on what may be the reasons for these results?
11. What did cortisol testing on babies (and their mothers) born around the time of 9/11 in New York suggest about the effects of stress on people?
12. What happens to Sofia's cortisol levels when her mother returns?

(4) Daniel

I've had to learn that you can't just sit there and whinge and complain about something that you can't control or stop or help. You've just got to make do with what you've got and you get in there and you do what you need to do and do it. (Kathryn, Daniel's mother)

1. What has happened to Daniel's older brother, Jamie?
2. What has been a regular part of Daniel's morning routine for the past five months?
3. How does Daniel's father, Rodney, seem to be dealing with the changes in their lives resulting from Jamie's tragic accident?
4. What changes has Daniel had to learn to accept in his life?
5. What does Kathryn see as the major loss for Daniel resulting from Jamie's accident?
6. What physical problem does Kathryn have to cope with in relation to her own health?
7. How are Kathryn and Rodney's stress levels different to those of other parents in the program?
8. Describe Daniel's grandmother's understanding of and response to the situation her daughter's family finds itself in.
9. What is the pattern of Daniel's cortisol levels?
10. How do the researchers describe these findings and how do they explain them?
11. What does Kathryn think are the effects on Daniel of having a profoundly disabled brother?



(5) Joshua

One thing I'm always concerned is the way I see other Chinese families put their kids through study. I think it's too intense. Of course I would like them to study more but I don't really want to put the pressure onto them. (Garry, Joshua's father)

1. What major change has Garry chosen to make in his life?
2. Compare and contrast his previous and current work situation in terms of stress, time and work satisfaction.
3. To what does Garry attribute his lower stress levels?
4. How do Garry's ideas about the importance of education potentially conflict with his wife, Steffi's views?
5. Describe the results of Joshua's cortisol tests.
6. How do these results seem to contradict what the researchers have observed of Joshua?
7. What do they speculate may be the reasons for these unusual patterns in Joshua's cortisol levels?
8. When are his cortisol levels shown to be at their lowest?
9. How does Garry assess his parenting skills?
10. In general terms what are your impressions of the way this family is managing?

(6) Wyatt

Got school, work, home, Wyatt and trying to have my own social life. (Tamara, Wyatt's mother)

1. How old was Glenn when Wyatt was conceived?
2. What is one advantage Tamara believes there is to being young parents?
3. What do Tamara and Glenn hope for in the next ten years?
4. Describe the complex minding arrangements Wyatt's parents have had to set up for him.
5. What are the advantages for both Wyatt and Tamara in having a crèche at the school Tamara attends?
6. What does Tamara do after school and for how many hours a week does she usually work?
7. Who minds Wyatt at this time?
8. Who is Wyatt's fourth carer for the day?
9. Describe the daily pattern of Wyatt's cortisol levels and whether they are considered to be 'normal'.
10. When are Glenn's cortisol levels highest?
11. How do these results compare with those of other fathers in this program?
12. How do Tamara and Glenn appear to be managing their complex lives with baby Wyatt, school and work commitments?

• Stress and how we measure it

The next section provides a more detailed overview of the science of stress and testing, particularly as this relates to the testing shown in this second episode of *Life at 1*.

• The chemistry of stress

We all need some stress in our lives – minor stressors are the stimuli that push us into action. Hunger, thirst, love, the need to succeed can be forms of *eustress* (eu = good) as opposed to distress. We often even enjoy scary situations such as riding a roller coaster or driving fast.

However, living in a state of constant, chronic low-level stress is a serious threat to our health. People in this condition may be disabled by depression; may have low immunity to diseases and infections; may have high blood pressure which can lead to strokes and heart failure later in life. We are also generally convinced that a stressful childhood leads to an anxious, depressive or unstable adult.

For these reasons the Institute of Childhood Studies is keenly interested in the role of a stressful environment in the formation of a child's personality. Is a person over-cautious or fearful because of childhood experiences or are they genetically programmed to be a 'worrier'? In the study of these children, not only are classic psychological tests such as the *scary robot* and *stranger encounter* observations given, but also bio-medical testing of their cortisol levels. Cortisol is a naturally occurring hormone which is known to increase in response to fear and stress situations.

• Fight or flight

First it is necessary to understand the biochemical and physical responses of the human body to stressors. What actually happens when we get a fright or are stressed over a longer period? The physical response to a sudden stress is often referred to as the 'fight or flight' syndrome – the body instantly prepares to defend itself or to run away.

When a caveman found a bear in his cave a million years ago his body responded immediately by releasing adrenal hormones. The secretion of these hormones increase the heart rate, dump glucose and fatty acids into the bloodstream for energy and divert blood supply away from the skin and the gastro-intestinal tract to the major muscles and brain. We are able to run and think faster because of this reaction. Frightened people often look pale because the blood drains from their skin – the lack of blood at the skin surface will reduce blood loss if an injury is suffered. They have 'butterflies' in the tummy as the gut shuts down – after all, we don't need to waste energy in digestion in an emergency; and get 'goose-bumps' as the skin tightens – a vestigial response in humans, to raise body hair in order to appear larger and therefore more intimidating to enemies. The mind speeds up to the point where time seems to slow down, but its thinking is not really logical or rational. It has more to do with survival and expressing emotions like fear and anger.

It's all very clever and sensible for the terrified caveman who has to actually fight that bear or run away very quickly. But what if the stressors are many, low-grade and persistent (chronic) such as family problems or difficulties at work? We experience the same effects but at a low level over a long period, leading to those serious health problems already mentioned.

• The Chemicals

In response to a scary or exciting incident the pituitary gland at the base of the brain releases the hormone Adrenocorticotropic Hormone (ACTH), an endocrine 'messenger'. This travels to the adrenal glands (ad-renal = above the kidney) which respond by releasing into the bloodstream epinephrine (adrenaline) and cortisol, amongst other hormones that cause those physical changes in the body. This is a very fast process and causes that 'rush' we feel when thrilled or frightened. The adrenal hormones are increased to well above normal levels – all of these have important functions in the body in such areas as glucose metabolism, immune response and inflammation response and are usually maintained at low levels. Corticosteroids or 'steroids' are often used to control inflammation or promote healing. That is why athletes may use them illegally to heal faster and increase muscle bulk.

Normally the excess levels of these hormones are broken

down quickly when the excitement is over but if we are living in a stressful environment, the high levels are maintained inappropriately and may damage our health. It is for this reason that the levels of cortisol in the blood and excreted into the urine and saliva are good indicators of chronic stress levels in a physically healthy individual.

• Cortisol testing

Normally the testing of cortisol levels in blood and urine is carried out to diagnose Cushing's Syndrome or Addison's Disease. Cushing's Syndrome is an overproduction of cortisol and results in obesity, weakness and muscle wasting. Addison's Disease is the opposite condition, an underproduction of cortisol which causes fatigue and increased pigmentation.

The use of saliva testing, especially to measure stress, is a new development, although experiments began in the 1970s. The evidence is that children in stable environments show little change in cortisol levels when they meet even major challenges, while those children in unstable environments who feel insecure have marked increases in response to even minor difficulties. A long term study begun in the 1970s (Arehart-Treichel) suggests that abnormal cortisol secretion patterns in the very young are an excellent indicator of clinical depression, both in the child and potentially developing later in the adult.

Cortisol is typically at high levels in the morning on waking and drops throughout the day to low levels by bedtime. This seems to reflect the normal rhythm of the day, with our need to be alert in the morning and relaxed ready to sleep by night-time. Stressed individuals seem to reverse this pattern or at least have far less reduction of cortisol as their levels are constantly topped up during the day by their responses to stressors. A normal range in the saliva for adults of either sex is 1.0 - 8.0 ng/ml in the morning and approximately one tenth of that in the evening. Obviously with such a wide 'normal' range it is difficult to draw conclusions from anything but the individual's normal rhythm and changes, and only then if measurements are taken frequently.

In recent years we have seen many mental disorders successfully treated by drug therapy, especially psychoses such as schizophrenia and bi-polar disorder. More recently depression (with Prozac and similar SRI medication) and ADD/ADHD (with drugs like Ritalin) have become common drug therapies. It is possible that in future, we will think of depressive people as a 'type' with a hormone imbalance who may benefit from early medical intervention. Given the possible overuse of treatment at present with anti-depression medication and treatment for hyperactivity in children, this is likely to be very controversial.

Student Activity 6

Discussion questions, tasks and research topics

• Experimental intrusion

These eleven children are being observed and monitored over seven years. However the results of those experiments and observations are being published (in the television documentary) and are known to the parents.

How might this invalidate the experimental results? Such as parents who believe that their child is stressed or developing slowly compared to the others may take steps to remedy the problem and so change the results.

- Research the meaning of a 'double-blind' experiment, where even the researcher would not know which data applied to which subject until the end of the experiment.
- Construct an experimental procedure for the cortisol testing of stress levels in a group of children that uses a proper double-blind protocol.

• Bioethics

- Is it ethical to test children in this way and risk labelling them as 'stressed' or less adaptable, especially when the test results are so variable and the interpretation of their meaning may be controversial?
- Is it dangerous to draw such important conclusions about vital personal factors such as temperament, personality and behaviour from a simple medical test?
- Would it be acceptable to medicate children 'at risk' of depression on the basis of this test alone? If not, what else would be required?

• Stress response and cortisol

We all respond very differently to stress. Some people remain calm in the face of their own imminent death while others panic if they break a fingernail.

- How does cortisol theory explain this difference?
- What do you think are especially stressful events in a family's life?
- How does being stressed tend to show itself in people's behaviour?

• The nature/nurture problem

One of the most difficult arguments in studying childhood development is the 'nature/nurture' problem. It asks if a person is the way they are mentally or physically because of the genes that they inherited or because of the environment in which they were raised. Obviously we inherit a mix of the genes from both our parents e.g. we resemble them physically, but what about our personality?

- Are we bad-tempered because we inherited genes for intolerance and anger or because we were raised in a household of angry people and modelled our behaviour on our parents?
- Are we overweight because we inherited 'fat genes' or because we were brought up in a family of over-eaters who had a poor diet?
- Are we friendly and outgoing because we inherited an extroverted personality at conception or because our parents made our first few years stimulating and full of new people?

Some of us like to believe that we were messed up by our parents because then it is 'not our fault' and we have someone to blame. However, scientists tend to dispute that belief by finding genetic flaws that we can inherit directly, e.g. genes which make some of us more likely to become overweight.

The truth is that we are a product of both our genes and our environment but the difficulty is in working out just how much each contributes to the personality and physique of the adult.

Classic experiments that study twins who have been raised by different adoptive families, often find that as as adults the twins are remarkably similar, despite having very different early home environments. If you aren't too impressed by your parents, this is very bad news indeed – perhaps you should have chosen them more carefully!

In *Life at 1* the researchers and observers will examine the role that both genetics and the environment play in the development of a child's personality. Clearly even at twelve months of age, many of the children have distinct personalities which we can label quite easily with terms like 'confident', 'cautious' or 'nervous.' Either they have a remarkable ability to pick up on their parents' moods or they were born with those characteristics. You will have to decide what you believe, based on the evidence presented here.

- Select two of the infants with distinct personalities. For each one list the personality characteristics; include any other data such as cortisol levels and suggest the factors that may have created that personality type under the headings 'genetic' and 'environmental.'

Student Activity 7

• Class Discussion

Conduct a class discussion on the two issues examined in Episode Two, based on your viewing of the program, your own experiences and information provided in this guide.

1. Time pressures and stress

When asked how often they are rushed or pressed for time most of the families in the program say always or often. What do they believe to be the major reasons for not having enough time each day and how does this problem contribute to their general stress?

2. The cortisol testing

The cortisol testing to monitor stress levels sometimes seems to produce results that are unexpected or at odds with the researchers' observations. Bearing in mind that these tests will be continued as the children grow up and may well change, how convincing did you find these test results as predictors and indicators of stress levels?

• How closely did you watch?

Quick Quiz about Episode Two

1. Which of the children has the most brothers and sisters?
2. How many of the six children are only children?
3. Whose mother and father are still teenagers?
4. Which child has a disabled brother?
5. Which babies are in regular outside day care?
6. Which baby's father was very sick for twelve months?
7. Whose father now works as a market gardener?
8. Which child's cortisol levels are described as 'surprisingly low'?
9. Which baby has surprisingly high cortisol levels throughout the day?
10. Whose father drives a taxi?
11. Whose mother has vision problems?
12. Whose father has several jobs?

(Answers on the last page of the notes)

Extension Activities

1. Write a single page preview/ review for a television guide about both episodes of this program, including the following:
   - A brief outline of what the program is about
   - A description of the balance of different elements in each episode
   - Your opinion of the program
   - Who you think would enjoy this documentary
   - What you found most interesting about it.
2. One of the topics this film investigates is the balance between nature and nurture, i.e. how much each of us is the product of our genetic inheritance, and how much our upbringing determines the adult we become. How well do you think *Life at 1* balances its study of these two aspects of childhood and growth?
3. Consider what we are told and shown about these eleven children and their families. Write down two questions you would like to ask each of the parents in order to better your understanding of their lives with their children.
4. Looking forward

   At the end of Episode Two the narrator indicates some of the challenges likely to be raised in the next programs as the children grow up. They include:
   - Are girls really doing better than boys?
   - Is it a fantasy that the modern dad spends more time with his children?
   - Could a key predictor to childhood obesity be how much exercise parents do?

   Set up a class debate on one or more of these questions, providing as much evidence as you can find for your point of view.

GLOSSARY

Longitudinal study – a study that involves the repeated observation or examination of a set of subjects over time.

Australian Institute of Family Studies – body responsible for the design and management of the 2004 study of 10,000 children and their families. The study has been funded by the Federal Government Department of Family and Community Services as part of the 'Stronger Families and Communities Strategy'.

The study – refers to the Institute of Family Studies study of 10,000 Australian children described above.

Nature versus nurture – this term refers to the balance between genetic inheritance and environmental factors in the shaping of a person's growth and development.

Cortisol – a hormone secreted from the adrenal gland that has a role in indicating and controlling stress.

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Sciencentral News Article assessing the results of cortisol testing of mothers and babies in relation to traumatic events: http://www.sciencentral.com/

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Films

7 Up (Michael Apted, 1964)

7 Up is the first in a series of films by Michael Apted following the lives of fourteen 7-year olds in Britain. Every seven years Apted has returned to film this group of people who are now 49. *49 Up*, the seventh film, was released in 2006. These films start with the premise from the Roman Catholic Jesuit Order, which says, 'Give me a child until he is seven and I will give you the man'.

Maternity Unit
(Janette Howe, 2005)

This program follows the drama and intensity of giving birth by going behind the doors of a maternity hospital in New South Wales.

Maternity Unit screened on SBS television in 2006.

Myths of Childhood
(Sarah Gibson, 1996)

This three part series investigates childhood in the western world in the late twentieth century. Teachers' Notes are available at: http://www.nfsa.gov.au/collection/film-australia-collection/program-sales/programs/teachers_notes/3992_mythchildnotes.pdf

Answers to the quick quizes:

Episode 1

1. Jara'na
2. Anastasija's
3. Three
4. Loulou's
5. Anastasjia
6. Ben, Anastasjia
7. Ben
8. Haleema's mother, Battena
9. Ben
10. Jara'na

Episode 2

1. Shine
2. Two, Declan and Wyatt
3. Wyatt's
4. Daniel
5. Declan and Wyatt
6. Sofia
7. Joshua's
8. Declan
9. Joshua
10. Shine's
11. Daniel's
12. Sofia's

Life at 1

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Writer/Director:
Catherine Marciniak
Producer:
Jennifer Cummins
Executive Producer:
Penny Robins
Duration: 2 x 55 minutes
Year: 2006

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