

Introducing the
**Longitudinal Study of
Australian Children**

LSAC DISCUSSION PAPER NO.1



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Foreword

This Discussion Paper represents the first formal publication from the Longitudinal Study of Australian Children (LSAC) – a landmark study initiated and funded by the Commonwealth Department of Family and Community Services as part of its Stronger Families and Communities Strategy.

The study aims to provide the database for a comprehensive understanding of Australian children’s development in the current social, economic and cultural environment, and hence to become a major element of the evidence base for policy and practice regarding children and their families.

As outlined in this paper, LSAC will deliver the first-ever comprehensive, national Australian data on children as they grow up. Longitudinal data are essential to answer many of the questions facing policy makers and researchers today. We know that the roots of many problems in adolescence and adulthood can be found in early childhood. The study will provide data tracking children over time, to help researchers to understand how, why and when children embark on pathways to adaptive and maladaptive outcomes, and where the opportunities are to help children move onto better pathways.

I am delighted that the Australian Institute of Family Studies is leading the consortium which is implementing this study. The Institute has a long history of research on a range of policy-relevant issues concerning children and their families. The LSAC consortium, which includes nine leading Australian institutions, has expertise across the broad array of areas which the study will examine – children’s experiences within their families, child care settings, schools and communities, and how these impact on all aspects of children’s development. These areas of development include children’s social, emotional, physical and cognitive functioning. The Institute, and the consortium, will be working in partnership with the Government to ensure the study is relevant to current policy concerns, and that the data are widely available to researchers.

This study will also rely on the cooperation and involvement of thousands of families across Australia. The LSAC consortium intends to make the families’ involvement in the study a rewarding experience, and we hope they will take pleasure and pride in knowing that they are contributing to a ground-breaking study which will benefit present and future generations of Australians.

David I. Stanton
Director
Australian Institute of Family Studies

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About the authors

Associate Professor Ann Sanson is Deputy Director (Research) at the Australian Institute of Family Studies, and is the Project Director for LSAC. Ann's research interests revolve around the development of children in their family and community contexts. For 19 years, she has been involved in the Australian Temperament Project, an internationally-recognised longitudinal study following a large representative sample of Victorian children from infancy through childhood and adolescence, which has addressed many issues concerning children's social, emotional and educational development.

Together, Ann Sanson, Dr Jan Nicholson, Associate Professor Judy Ungerer and Professor Stephen Zubrick formed the working group which took primary responsibility for writing the initial proposal for LSAC to the Department of Family and Community Services.

Dr Jan Nicholson is Senior Research Fellow at the Centre for Public Health Research, Queensland University of Technology. Jan has research interests that involve longitudinal investigations of the effects of family and school factors on the health and wellbeing of young people, and the development and evaluation of community-based programs to prevent family-related mental health problems.

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Professor Stephen Zubrick is Head of the Division of Population Science at the TVW Telethon Institute for Child Health Research in Western Australia, and Co-Director of the Centre for Developmental Health at Curtin University. Stephen is trained in psychology and speech pathology, and is known for his Australian research using large-scale community based random samples of families to study the complex relationships in health, mental health and competency across family, community and school settings. He is one of the authors of the *WA Child Health Survey*, a chief investigator on the *WA Aboriginal Child Health Survey*, and is conducting research to study causal pathways in maternal and child health.

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The other authors are all active members of the LSAC Consortium

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Summary

This discussion paper presents an overview of the Longitudinal Study of Australian Children (LSAC), incorporating descriptions of the rationale for the study, relevance for policy development, the conceptual framework, broad and specific research questions, and study design. The bulk of the paper is taken up with a discussion of current thinking about how the research questions will be addressed, and what data are to be collected.

The consortium

The study is being conducted by a consortium of nine leading research organisations, with the Australian Institute of Family Studies acting as the lead organisation. A Project Operations Team is housed at the Institute, and is supported by a Consortium Advisory Group comprising the following members: Associate Professor Ann Sanson, Professor Steve Zubrick (Chair), Dr John Ainley, Dr Donna Berthelsen, Dr Michael Bittman, Dr Dorothy Broom, Dr Linda Harrison, Dr Jan Nicholson, Professor Michael Sawyer, Professor Sven Silburn, Associate Professor Judy Ungerer, Professor Graham Vimpani, and Dr Melissa Wake (refer to pages viii–ix for the institutional affiliations of members).

Background and rationale

The Longitudinal Study of Australian Children has been funded as part of the Department of Family and Community Services *Stronger Families and Communities Strategy*, which aims to establish new partnerships to strengthen families and communities and develop and deliver solutions at a local level.

The survey results will be used by the Department of Family and Community Services, a range of other Commonwealth and State and Territory departments, and the research community. A total of \$20.2 million has been allocated to the study over nine years, and this investment indicates the importance the Commonwealth Government places on the early years of childhood.

The data will add to the understanding of early childhood development, inform social policy debate, and be used to identify opportunities for early intervention and prevention strategies, in policy areas concerning children – specifically parenting, family relationships and functioning, early childhood education and schooling, child care, and health.

Longitudinal studies are essential tools for obtaining high quality evidence about the determinants of health and wellbeing. This evidence is vital to address key policy issues satisfactorily. LSAC is designed to examine the impact on the next generation of Australia’s unique social and cultural environment. The study will have a broad, multi-disciplinary base, involve a nationally representative sample of children, and examine issues of current and future policy relevance.

Conceptual framework

The study adopts a holistic approach to child development, being concerned with outcomes across multiple domains of development. The theoretical framework in which the study is grounded is an ecological model of

development, originating from Bronfenbrenner (1979). The family, school, community and broader society, as well as the child's own attributes, are seen to contribute to the child's development in complex interacting ways over time. Reciprocal interactions between children and their environment are key influences on children's development.

Within this ecological framework, LSAC will take a "developmental pathways" approach, with an emphasis on "trajectories". This perspective seeks to identify the factors that determine pathways through life to good and poor outcomes, and factors that influence changes in these pathways, especially at crucial transition points such as entry into child care or school settings. By identifying early indicators that children are embarking on disadvantageous pathways, and the factors that divert children away from these pathways, interventions can be designed to help change children's course through life.

Research questions

The study will address the following seven *broad research questions*:

- How well are Australian children doing on a number of key developmental outcomes?
- What are the pathway markers, early indicators, or constellations of behaviours that are related to different child outcomes?
- How are child outcomes interlinked with their wider circumstances and environment?
- In what ways do features of children's environment (such as families, communities, and institutions) impact on child outcomes?
- What helps maintain an effective pathway, or change one that is not promising?
- How is a child's potential maximised to achieve positive outcomes for children, their families and society?
- What role can the government play in achieving these outcomes?

Fourteen further *specific research questions* are grouped under the headings of "Family functioning", "Health", "Non-parental child care", "Education", and "Cross-discipline". The paper outlines the theoretical rationale for each of these questions, and describes how each will be addressed. Many of these research questions involve common input variables and child outcome measures, whether the question concerns health, education, child care, or family functioning.

Child outcomes to be measured include behavioural and emotional adjustment, language and cognitive development, readiness to learn, overall health, motor/physical development, and social competence. Data will also be collected on key factors influencing developmental outcomes. These factors relate to the child (for example, health, temperament, literacy experiences), the parents (for example, socioeconomic status, parenting style, health), and the broader family, child care, school and community environments. In addition, information on key life events which can lift or depress a developmental trajectory (for example, illness or injury, entry to child care or school, separation or divorce of parents) will be collected.

The data obtained will allow for modelling of complex interactive pathways between the factors (at all levels of the child's environment) and child outcomes, providing important information about the type and timing of possible interventions to support children and their families.

Study design

A longitudinal design is essential to explore the developmental sequences that place children at risk, and to illuminate protective factors. A multiple cohort cross-sequential design has been selected, providing for coverage of two cohorts expected to be as follows:

- a minimum of 5000 children aged less than 12 months, selected in 2003, and followed at least every two years until they reach 6–7 years of age in 2009; and
- a minimum of 5000 children aged 4–5 years when selected in 2003, and also followed at least every two years until they reach the age of 11–12 years of age in 2009.

There will be two stages in the development and implementation of LSAC. In Stage One, the study design and instruments will be refined and tested, and a detailed project plan will be developed. This stage is expected to take approximately one year. In Stage Two, (currently projected at eight years), the data will be collected and prepared for release to users.

Study participants will include the child (when of an appropriate age) and their parents, as well as child care providers and teachers. Methods of data collection will include face-to-face interviews, questionnaires, observations and direct assessment. The sample will be clustered, with clusters most likely to be based on postcodes, enabling data on characteristics of the children's communities to be gathered.

Data analysis and user support

It is intended that the LSAC data will be made widely available to researchers. The data will be warehoused at the Australian Institute of Family Studies and a range of support services will be provided to data users.

Given the longitudinal nature of the study, data will be collected and presented to facilitate across-time analyses. These will enable researchers to disentangle the direction and magnitude of relationships between the major items of interest, and to identify causal pathways for both positive and negative outcomes.

Policy development and evaluation

Recent decades have seen considerable changes to the family and broader environments in which Australian children are reared. In order to understand the impact of these changes on our nation's children, a new, multi-disciplinary, longitudinal study of a large nationally representative sample is necessary.

The Longitudinal Study of Australian Children will address a range of research questions about children's development and wellbeing, including the roles of families, communities and government in facilitating positive outcomes for

children. The study represents a major step towards building the evidence base on which to develop sound policies in areas concerning children, specifically parenting, family relationships and functioning, early childhood education and schooling, child care and health.

Established longitudinal studies have identified a variety of individual, familial and community risk and protective factors for young children that are associated with differential outcomes over time. Risk factors for adverse outcomes may have cumulative and long lasting effects on children's health and development over time. However, protective factors can interact with risk factors and foster the development of resilience, so that not all "high risk" children develop intractable problems in childhood or later life. Drawing on this insight, LSAC data will be used to identify opportunities for interventions that can foster and reinforce a child's strengths at major life transitions.

Currently, our capacity to develop appropriate interventions is limited by our lack of knowledge about children's developmental trajectories, and our inadequate understanding of the complex pathways involved. Furthermore, existing overseas studies have limited policy relevance to the unique Australian context. LSAC has been designed to redress this information gap and will be an invaluable resource for a range of government bodies and other researchers.

Data collected for the study may enable the evaluation of large-scale policy changes that take place during the life of the study; for example, changes to universally available services such as child care funding support. It will also support the evaluation of types of programs or services; for example playgroups or pre-school services. Finally, the analysis of LSAC data may suggest the efficacy of interventions – for example, insights into family functioning may suggest new directions for support services during critical life changes such as divorce and re-partnering.

The study also offers a core database and infrastructure which could complement other research programs. Data from the study could be used to benchmark evaluations of targeted or small-scale policy initiatives. There is also the potential for "nested studies" that draw on LSAC infrastructure to set up research in specific geographic areas or on targeted groups.

Australia has lagged behind other western nations in its investment in national population-based longitudinal research. The Longitudinal Study of Australian Children will provide a broad, long-term evidence base for policy makers, practitioners and others to develop and refine strategies for improving the developmental health of Australians.



1 Introduction

The Longitudinal Study of Australian Children (LSAC) will gather comprehensive, national Australian data on all the important domains of a child's life – their experiences within their families and communities, their health, their child care experiences, and the early years of their education. This study is a major step towards building the evidence base on which to develop sound policies in areas concerning children – specifically parenting, family relationships and functioning, early childhood education and schooling, child care and health.

This first discussion paper focuses on the research questions that LSAC is designed to address, and how they will be addressed. To provide a context for these, the paper also gives a brief rationale for the study, a description of the organisational structure of the consortium that will implement it, and an outline of the study's design. Given that 2002 will be a “development” year for the study, many of the details are not yet finalised. However, we hope that this paper will give readers a sense of the potential of the study to make a meaningful contribution to research, policy and practice regarding young Australians and their families.

Background and rationale

In the 2000–2001 Budget, the Commonwealth Government announced its intention to undertake a comprehensive, national longitudinal study of children and their families. The study is part of the Department of Family and Community Services *Stronger Families and Communities Strategy*, a new initiative for supporting and strengthening Australian families and communities. The Strategy is based on a holistic approach to problem identification, prevention and early intervention, and a commitment to evidence-based policy and practice. LSAC is intended to make a major contribution by establishing an up-to-date evidence base for guiding policies that will promote the optimal development and wellbeing of Australian children.

It is now recognised that longitudinal studies are essential tools for obtaining high quality evidence about the determinants of health and wellbeing (Farrington 1991; Rutter 1994). There is also a growing acknowledgment of their value in addressing key policy issues. Several western nations have well established longitudinal studies tracking the development of young people from birth to early adulthood. These studies have included comprehensive, long-term studies of children and young families conducted in New Zealand (Fergusson et al. 1989; Silva and Stanton 1996), the United Kingdom (Golding 1990; Hope et al. 1999), and the United States (Hawkins et al. 1992). A number of countries have recently established large new longitudinal studies – for example, Canada, the United States, Scandinavian countries and the United Kingdom. There have

been several influential longitudinal studies of children's development in Australia (for example, McMichael et al. 1992; Najman et al. 1997; Prior 2000), but Australia has lagged behind other western nations in its investment in national population-based longitudinal research (Nicholson et al., in press).

Past longitudinal studies have identified a variety of individual, familial and environmental risk and protective factors for young children that are associated with differential outcomes over time. Examples of risk factors include low birth weight, poor housing, and lack of community support networks. Risk factors for adverse outcomes frequently occur together, and they may have cumulative and long lasting effects on children's health and development over time. For example, family adversity is a risk factor for attention difficulties, poor cognitive performance and delinquency (Silva and Stanton 1996).

However, risk is not destiny, and the nature and total number of risk factors present and the context of their expression is as important to individual children's outcomes as the mere presence of "risk". Many "high risk" children do not develop intractable problems in childhood or later life, but instead exhibit resilience, a capacity to cope with life's setbacks and challenges. Protective factors such as easy temperament, attachment to family, and positive social networks can interact with risk factors and foster the development of resilience. Although the pathways to resilience are complex, they provide opportunities for interventions that foster and reinforce a child's strengths. That is, the presence of positive opportunities at major life transitions represents a second chance for many "at risk" children and adults. Currently, our capacity to make appropriate interventions is limited by our lack of knowledge about the factors that influence children's resilience across the lifecourse, and our inadequate understanding of the complex pathways involved.

There are several other important reasons to establish a new Australian longitudinal study of children at this point in time.

First, in recent decades there have been considerable changes to the family, community, educational, technological and economic environments in which Australian children are reared. Poor, and in some cases worsening, indicators of children's health and wellbeing (such as high rates of diabetes, youth suicide, assaults by adolescents, and child abuse; the gap in literacy between high and low socioeconomic groups) have led some researchers to label the current situation a "crisis" in child outcomes (Stanley 2001).

Second, there is a need for broad-based research employing large, representative samples. Past Australian longitudinal studies have typically focused on a narrow range of outcomes, with most having an emphasis on children's health rather than addressing the broad range of interrelated social, emotional and cognitive outcomes (Nicholson et al. 2002). Further, few of these studies have been national in scope or fully representative of the population, and most have had sample sizes too small to enable the study of complex developmental processes or the prediction of rare events. A new, multidisciplinary, longitudinal study collecting data on a large representative sample would overcome these limitations and facilitate the interface between research and broad-based prevention and intervention initiatives.

Third, overseas studies have limited policy relevance to Australia. Our environment is unique in terms of ethnic diversity, social structures, some

aspects of family structures, policies and service provision, and the geographical distribution of the population.

Fourth, a large Australian longitudinal study of children offers the potential to provide a core database and infrastructure that could complement other research programs, and be a useful resource for a range of government bodies and other researchers.

In sum, a new, national, multi-disciplinary, longitudinal study would afford an opportunity to investigate the ways in which the new social environments of children may support, or place at risk, the development of children in the Australian context, and would aid identification of opportunities for providing early intervention and prevention. This information would provide a sound evidence base for the development of more effective social policy aimed at supporting families and communities in the task of optimising the development of Australia's children.

To address the issues outlined above, in 2000 the Commonwealth Department of Family and Community Services (FaCS) committed \$20.2 million over nine years to a longitudinal study of Australian children, and sought proposals from suitably qualified organisations for the detailed design, development, implementation, and management of the study. The contract has been awarded to a Consortium led by the Australian Institute of Family Studies. A Project Operation Team, housed at the Institute, will be responsible for day-to-day management of the project. The team will consist of the Project Director (Ann Sanson), the Design Manager (Christine Millward), and a Survey Manager (Carol Soloff, who is outposted from the Australian Bureau of Statistics).

Besides the Institute, the LSAC Consortium includes eight other leading research organisations, listed below:

- The Institute for Child Health Research, Western Australia;
- The Australian Council for Educational Research;
- Macquarie University;
- Charles Sturt University;
- Murdoch Children's Research Institute;
- National Centre for Epidemiology and Population Health and the Centre for Mental Health Research, Australian National University;
- Queensland University of Technology;
- Social Policy Research Centre, University of New south Wales, and
- Several independent consultants.

The Consortium Advisory Group will have an ongoing advisory role in the development and implementation of LSAC. It includes researchers from a diverse range of disciplines spanning psychology, sociology, education, early childhood studies, psychiatry, paediatrics and child health, epidemiology, public health and family studies. This broad-based expertise will help to ensure that LSAC is designed to cover a comprehensive range of influences on child development, from biological and psychosocial to socio-cultural levels.

Consortium members range from those with expertise in micro-level analyses of child development to organisations with a strong social policy focus. Several members of the Consortium have prior experience as key investigators conducting longitudinal studies and large-scale population-based surveys (for example, the Australian Temperament Project, the WA Child Health Survey and Aboriginal

Child Health Survey, and the Port Pirie Cohort Study). Further, the Consortium includes a combination of national and state-based organisations, geographically covering most of Australia, and ensuring that LSAC will be a truly national study.

An additional advisory group, the Scientific and Policy Advisory Group, will be appointed during 2002 to provide high level strategic, scientific and policy input. It will consist of national and international experts within all aspects of child development covered by LSAC, as well as longitudinal research methodology and policy research.

Policy development and analysis

Recent decades have seen considerable changes to the family, community, educational, technological and economic environments in which Australian children are reared. To ensure their optimal health and wellbeing, it is vital that policy-makers understand the short- and long-term impacts of these new environments on Australian children.

It is now widely recognised that longitudinal data are essential to analyse change. However, Australia has lagged behind other western nations that already have longitudinal studies tracking the development of young people from birth to early adulthood. Evidence on factors determining children's developmental outcomes from international longitudinal research may not be applicable to Australian children. It is essential that Australian research be conducted that can inform social policy development in the Australian context. In particular there is a need for research that can identify opportunities for providing early intervention and prevention. As noted earlier, previous Australian longitudinal studies have been limited in scope or sample size. Moreover, they are of uncertain applicability to the current context, and few have specifically focused on policy relevance as a key criterion.

The data gathered by LSAC can be put to a number of uses within the process of planning and evaluating new policy initiatives. LSAC data will include areas concerning young children that cross a number of sectors of government and the community. Analysts and policy makers will be attempting to disentangle the direction and magnitude of causal relationships between items of interest, while the collection of baseline information on a range of variables will be useful for the evaluation of many policy initiatives.

Large-scale policy changes (for example, changes to universally available services such as child care funding support, or major new initiatives such as increased financial support for parents following the birth of their child) may produce effects that can be monitored and evaluated. LSAC data will also support the evaluation of broad types of programs or services, for example playgroups or pre-school services. Finally, data analysis should suggest patterns of efficacy for targeted or new intervention and prevention strategies; for example, insights into family functioning may suggest new directions for support services during critical life changes such as divorce and re-partnering.

The study also offers a core database and infrastructure which could complement other research programs. Data from the study could be used to benchmark evaluations of targeted or small-scale policy initiatives. There is also the potential for "nested studies" that draw on LSAC infrastructure to set up research in specific geographic areas or on targeted groups.

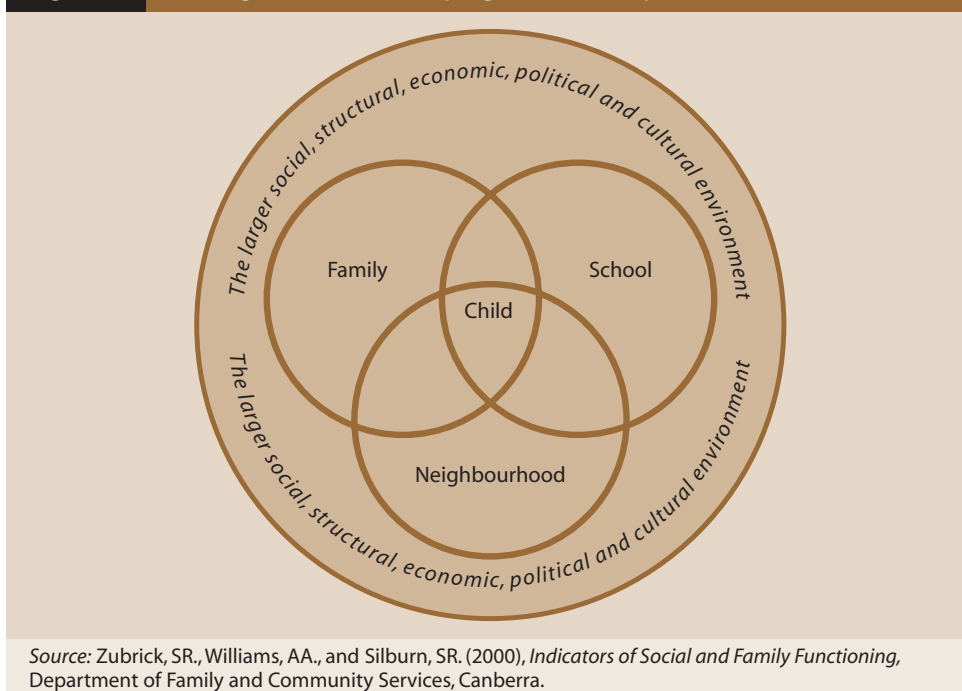
Conceptual framework

Previous research has identified a range of influences on children's developmental outcomes, spanning individual and family characteristics and the broader social, economic and physical environments in which children are raised (Berkman and Kawachi 2000; Keating and Hertzman 1999). Consequently, LSAC adopts a holistic approach to child development, being concerned with outcomes across multiple domains of development. The theoretical framework in which the study is grounded is an ecological model of development. The family, school, community and broader society, as well as the child's own attributes, are seen to contribute to the child's development in complex interacting ways over time.

This "ecological" model of child development (see Figure 1) originates from Urie Bronfenbrenner (1979). In this model, child development is seen as a process in which biological and other child characteristics interact reciprocally with the environment over the course of life, so children affect their environments as well as being influenced by them. Parents and family remain significant influences throughout childhood, but are increasingly added to by other sources of environmental influence such as peers and the school environment. The larger social structural, economic, political and cultural environment impacts on the resources available to families and to children. The character of the communities in which children live, including the economic climate and access to appropriate services, have significant influence on children's development; and cultural influences are transmitted directly by parents and other adults from birth as well as via a range of other sources such as stories, songs and the media.

Within this ecological framework, LSAC will take a "developmental pathways" approach, with an emphasis on "trajectories" – a child's unique course in life, including the different directions taken at crucial transition points, for example,

Figure 1 Ecological contexts shaping child development



at entry into child care or school settings. This approach seeks to identify pathways and the markers (or characteristics/factors) that predict the course of those pathways. For example, young children who experience poverty, parental separation, or abusive or inept parenting styles may have an increased risk of involvement in criminal activity at an older age; however, some among them will exhibit resilience and healthy developmental outcomes. By identifying early indicators of risk and resilience, appropriate intervention can be made in a child's life to change their course through life.

Research questions

The study of children's early life experiences involves examination of highly complex inter-relations. LSAC aims to identify the key factors influencing child outcomes over the developmental life course in the early years, including their interaction.

The study will address the following *seven broad questions*:

- How well are Australian children doing on a number of key developmental outcomes?
- What are the pathway markers, early indicators, or constellations of behaviours that are related to different child outcomes?
- How are child outcomes interlinked with their wider circumstances and environment?
- In what ways do features of children's environment (such as families, communities, and institutions) impact on child outcomes?
- What helps maintain an effective pathway, or change one that is not promising?
- How is a child's potential maximised to achieve positive outcomes for children, their families and society?
- What role can the government play in achieving these outcomes?

These high level questions have informed *14 specific research questions*. The specific questions, and the Consortium's current thinking about how these questions will be addressed, is detailed in Section 3 "Specific research questions".

The next section briefly describes the rationale underlying the decisions about the study design which will be implemented to address the research questions outlined above.



2 Study design

To provide the necessary information to guide future policy regarding children's development, a longitudinal study is preferred over a cross-sectional study. Longitudinal data involve repeated measures of the same people over time; cross-sectional data involve measures at one time only. Thus, cross-sectional research can only measure the *prevalence* of a factor of interest at a certain point in time, while longitudinal research measures prevalence at several points of time, and in addition, can provide information on *causation, prognosis, stability, and change* (Rutter 1988). Given the developmental pathways model which underpins LSAC, a longitudinal design is essential.

Advantages and disadvantages of longitudinal designs

Longitudinal studies enable factors of interest to be examined for their stability and continuity over time, and allow developmental sequences to be identified. For example, do behavioural difficulties exhibit different manifestations at different ages? How far can later events be predicted by earlier events? Can anxiety in early or middle childhood be traced back to a particular style of temperament or parenting in infancy? Is childhood obesity preceded by particular parental expectations or parenting practices in toddlerhood? By establishing the time ordering of events, longitudinal studies can help establish causal relationships.

In addition to exploring the developmental sequences that place children at risk, a longitudinal design can illuminate the factors that protect children against risk and create resilience. That is, why do some children who are exposed to adverse conditions still do well? What can we learn from observing the developmental sequences of those children? Understanding children's developmental sequences sheds light on when intervention would be most effective (Farrington 1991).

A further advantage of a longitudinal design is that it enables us to differentiate between change over time in aggregate (group) data and changes within individuals or changes in a population at risk. While cross-sectional data only allow investigation of differences *between* individuals, a longitudinal study can examine change *within* individuals, as well as variation between them (Farrington 1991).

While having many advantages over cross-sectional research, longitudinal research also poses several challenges. It is crucial to select the most appropriate longitudinal design. Farrington (1991) presents a clear discussion of the strengths and weaknesses of various longitudinal designs. After careful consideration of all the issues raised, and bearing in mind the currently allocated budget, the Department of Family and Community Services and the LSAC consortium have elected to employ a type of accelerated longitudinal design, namely, a multiple cohort cross-sequential design. These terms are explained below.

A *cohort* is a group of individuals born around the same point in time (typically within one year). A *multiple cohort* design uses more than one cohort. In the case of LSAC, there will be two cohorts: one of children under the age of 12 months at the commencement of the study, and another of four year-olds. Using more than one cohort of children allows greater confidence that the results obtained are not specific to one cohort but can be generalised to other groups of children.

LSAC is an *accelerated* longitudinal design in that, over the currently projected data collection period (2003–2009), it will be possible to examine children's development from birth to the age of about 11 years. It is *cross-sequential*, in that there will be data on children of the same age from the two cohorts at different points in time (for example, on four–five-year-olds from cohort 2 in 2003 and cohort 1 in 2007). An advantage of such a cross-sequential design, in comparison to a single-cohort study, is that it is not so long before results are available, and there is less concern that theories, instruments, and policy issues will be out of date by this time. A cross-sequential design also reduces difficulties in sample retention over time, since the total follow-up time is shorter. Farrington (1991) recommends a follow-up period of about seven to eight years to maximise advantages and minimise disadvantages of longitudinal studies. This is the time frame over which LSAC will follow the children and families in the study, although it is to be hoped that the study will continue indefinitely.

Another potential problem of longitudinal studies is that *age* or *developmental* effects, *time of measurement* or *period* effects, and *cohort* effects may be confounded (Farrington 1991). It is important to distinguish between these different types of effects.

As an example of a cohort effect, people born into a “baby boom” may experience more competition for resources at all ages and in all periods than people born at a time with a lower birth rate. Hence findings on the “baby boom” cohort may not generalise to other cohorts. Period effects may occur, for example, when data are collected at a time of high unemployment. Changes that occur at this time might be attributable to the consequences of high unemployment rates.

Developmental effects are simply those changes occurring naturally by growing older. In single cohort studies, it can be difficult to know whether developmental, cohort or period effects are responsible for observed changes over time. The cross-sequential design of LSAC lessens this problem, because of the substantial age overlap of the two cohorts. That is, data from ages four to seven years will be available from both cohorts, but will be collected at different time periods (cohort 1: 2006-2009; cohort 2: 2003-2006), and about children with different birth dates (2002-2003 and 1998-1999 respectively), making it possible to study maturation and developmental changes independently of the period of measurement.

Base design of LSAC

There will be two stages in the development and implementation of the Longitudinal Study of Australian Children. In Stage One, the study design will be refined and tested, and a detailed project plan will be developed. This stage is expected to take approximately one year. In Stage Two, (currently projected at eight years), the data will be collected and prepared for release to users. It is

intended that the data will be warehoused at the Australian Institute of Family Studies and user support will be provided.

The sample

The essential focus of the study design is on the early years of children's lives, and therefore defines "the child" as the sampling unit of interest. The design will allow for assessment of developmental outcomes from infancy until late childhood. It provides for an expected coverage of two cohorts as follows:

Cohort 1	<i>Age 0–1 year in 2003:</i> a cohort with a minimum size of 5000 Australian children aged under 1 year will be selected in 2003, and followed at least every two years until they reach 6–7 years of age in 2009.
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Cohort 2	<i>Age 4–5 years in 2003:</i> a cohort with a minimum size of 5000 Australian children aged 4–5 years will be selected in 2003, and followed at least every two years until they reach 11–12 years of age in 2009.
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Study participants

Participants in the study include the child's parents, as well as child care providers and teachers, the child (when of an appropriate age), and interviewers who will undertake direct observations and assessments. By including a face-to-face interview with the primary parent (typically the child's biological mother), and a supplementary interview with the non-primary parent, LSAC will exceed most existing studies in the depth and quality of the data collected. Information from the second (non-primary) parent, whether this parent is resident with the child or not, represents a key area where LSAC will go beyond most existing studies.

Data from child care providers, preschool and primary school teachers will be collected via mail questionnaires. Data on characteristics of the children's communities will also be gathered. Besides the main biennial data collection, there will be mail-out data collection from the children's primary caregivers in 2004, and possibly also in 2006 and 2008.

Sample design

It is intended that the sample will be representative of all Australian children in each of the selected age cohorts. A clustered sample design has been chosen for two reasons: first, it provides the opportunity to gather multiple observations within a community, increasing the capacity of the study to analyse community-level effects; and second, it offers the opportunity to cost-effectively conduct face-to-face interviews. Clusters are most likely to be based on postcodes. Due to the extreme costs involved, face-to-face interviews with families in remote areas will not be possible without additional funding.

Sample selection

According to Australian Bureau of Statistics figures (ABS 1996), only about one in 52 Australian households at any one time has a child aged less than 12 months, and a similar proportion has a child aged four years. Hence identifying families with children of in-scope ages is a substantial task. One option currently being considered to reduce these "search" costs is to over-sample from areas that have moderate-high populations of women of child-bearing age, and to under-sample from areas of very low populations of such women. This procedure would provide a more cost-efficient coverage of the population, but would still

ensure that the sample includes children from areas where there are fewer women of child-bearing age.

It is theoretically possible to over-sample children with particular characteristics (for example, children with disabilities of various sorts, or children from indigenous or culturally diverse families). However, a major strength of a study like LSAC is the large and nationally representative nature of its sample, and it is the Consortium's opinion that more intensive studies of such subgroups are better conducted as separately funded studies, perhaps nested with or linked to LSAC.

Sampling frame

The central issue faced with any sampling process is that of the sampling frame. Conceptually, this frame is a listing of all the members of the population being sampled, but no such perfect list actually exists. Sampling frame options are still being explored.

One sampling option is through the telephone, where two approaches are possible. A telephone-based listing potentially provides the required coverage of the target population as 97.5 per cent of households within Australia have a fixed telephone (ABS 1996). Reverse Directory CD-ROM (CD-ROM RD) databases contain the entire white page and yellow page directory listings. These databases enable a search and subsequent list of any field (name, street address, suburb, postcode or telephone prefix) within the directory. Such databases are currently the standard for sample management throughout Australia.

The CD-ROM RD allows a postcode structured listing of all households with a fixed telephone. However, this sampling frame has several limitations. First, CD-ROM listings lag the most recent Electronic White Pages (EWP) listings by 4–16 months; second, all telephone directories (hard-copy, CD-ROM RD and EWP) exclude "silent" (non-listed) telephone numbers (about 13 per cent of all private households in Australia (Steele 1996)); and third, the increasing popularity of mobile telephones in recent years may ultimately lead to its preferred use as an alternative to a fixed telephone, which could introduce a bias in the coverage.

Random Digit Dialling (RDD) is a non-directory listing strategy. While it might also introduce bias due to increasing use of mobile phones, RDD offers a sampling frame that would at least ensure that silent numbers and recent connections not yet published in directories had the same probability of selection as the directory-listed telephone numbers. However, since it is more likely that those with silent numbers would refuse involvement in the study rather than cooperate, it is highly debatable that an RDD sampling frame offers any substantial improvement to the "representativeness" of the population enumerated. Furthermore, the screening process required to contact only private households (that is, not businesses or other associations and organisations) within the RDD listing can be highly resource intensive.

A second option being actively investigated is the use of information on names and addresses from Medicare records held by the Health Insurance Commission. This would require strategies to be in place to protect customers' privacy. Medicare records cover 96 per cent of the population of newborns within ten days of birth, and contain data on all children's date of birth. If the use of Medicare records becomes feasible, there would be considerable cost savings in locating the required sample. It could also be possible to recruit from a narrower age range within each cohort (for example, four months rather than 12 months),

enabling greater focus on developmentally appropriate questions. Further, data collection could potentially be spread out over a longer period of time, allowing the use of a smaller pool of more highly trained interviewers.

Data collection

The consortium has considered various options for data collection for Longitudinal Study of Australian Children, including: mail-out questionnaires; the Internet; telephone interviewing, using Computer Assisted Telephone Interviewing (CATI) facilities; face-to-face interviewing in the home, which may also provide for Computer Assisted Personal Interviewing (CAPI); and observational and direct assessment methods. Each of these options, either separately or in combination with each other, could provide opportunities for cost-efficient collection of information appropriate at different stages of the nine year study program.

Face-to-face interviews in the home have been chosen as the principal method of data collection from the primary caregiving parent, who will be the *key respondent* at each phase of the study. The use of face-to-face interviews for data collection provides considerable advantages over other methods. They provide an opportunity for interviewers to develop rapport with the participants, which builds a sense of loyalty to, and identification with the study, with flow-on effects of enhancing sample retention rates. They enable collection of more detailed and in-depth data than can typically be collected from phone interviews or mail-out questionnaires, thus improving data quality. And they allow for opportunities for direct assessments and observations of the child and the child's environment to be made. Consequently, face-to-face interviews result in more valid and reliable data.

Depending on the sampling frame, the first contact with primary respondents will be either by letter or by phone. If by phone, current expectations are that there will be an initial 20-minute telephone interview, followed by a face-to-face interview of approximately 40 minutes. The precise balance of information to be covered by phone and face-to-face interviews will be resolved during the study development phase. If the first contact is by letter, the length of the home interview could be extended. Core sets of questions will be common across both age cohorts, and there will also be a specific block of developmentally appropriate questions in relation to each cohort. While most items will consist of closed questions, there will also be some open-ended questions.

Additional data will be collected from a second parent (secondary respondent) where available, whether resident with the child or not. The method of data collection will be via face-to-face interviews (of approximately 15 minutes duration) where possible, and, when not possible, by phone interviews or mail-out questionnaires (the method to be selected during the development phase of the study).

Further data will be collected via mail-out questionnaires from the child's care providers, preschool teachers and primary school teachers.

The interviewers undertaking the face-to-face interviews will provide a further information source. They will be trained to undertake a series of observations and assessments of the child and their living environment during their visit.

The multi-source nature of the information to be collected in LSAC will increase the reliability of the obtained data and will represent a significant advance over most existing studies.

Face-to-face interviews will be conducted on a biennial basis. To avoid missing a significant amount of important information with survey dates two years apart, especially when the children are young, we intend to include supplementary mailed questionnaires to the primary caregivers in 2004 (between the first and second wave). Similar additional data collection between the later biennial face-to-face interviews is also under consideration.

Development of data measurement

The planned study development program will comprise:

- an initial study design program of pre-tests and a pilot-test/dress rehearsal to confirm instruments, fieldwork procedures and documentation for the first wave (Stage One); and
- an ongoing program to validate all later instruments, including the insertion of new age-appropriate questions throughout the entire life of the program (Stage Two).

Stage One of LSAC (approximately the first 12 months of the project) provides for a full study development program, including identification of data items, and a series of inter-related skirmishes or pre-tests in which various sets of questions and scale measurements will be developed and validated. This phase of the study development program will involve establishing respondent panels for focus group and in-depth personal interview evaluations of specific issues and related question sets.

To enable the longitudinal aspects of the study design to be tested and evaluated, a separate pilot sample will be maintained over the course of the project. The ongoing pilot sample will mirror the main study and therefore allow the new sets of questions applying to later age groups to be tested in exactly the way that they will be presented to the main study respondents.

Measurement instruments

As noted above, data items and instruments will be selected during Stage One. Given the breadth of intended coverage of LSAC (all aspects of child development within a family and community context), economy and time efficiency will be paramount considerations. Overly long interviews increase the burden on respondents and potentially increase sample attrition rates. Thus it will be essential to choose the fewest number of items and scales to collect the requisite data.

Several important principles, listed below, will guide the selection process.

In relation to the theoretical *constructs* selected for investigation, criteria will include:

- explanatory power in relation to the articulated scientific framework;
- population relevance, in terms of burden and prevalence;
- perceived importance to policy; and
- (for potential risk and protective factors) amenability to change through intervention.

Regarding *items* and measurement *scales*, selection criteria will include:

- established reliability and validity;
- acceptability to respondents;
- how well they measure central constructs;
- comparability with other international or national studies; and
- lack of redundancy (data are not available elsewhere)

Outcome measures

At each of the data collection points a wide range of age-appropriate developmental outcomes, influences and life events will be measured, as shown in Table 1 (on page 39-41). It should be noted that in a longitudinal design, outcomes at one point in time can become predictive factors for later outcomes.

Key factors influencing outcomes

At each of the data collection points data will be collected on key factors influencing children's developmental outcomes. These factors relate to the child (for example, health, temperament, literacy experiences), the child's parents (for example, socioeconomic status, parenting style, health), and the environment (for example, neighbourhood resources, child care provider, school).

Further, significant events that occur in children's lives can lift or depress their developmental trajectories. Indicative key life events include illness or injury, birth of a sibling, moving house, entry to child care or school, death of a family member or friend, a spell of poverty, and separation or divorce of parents. Some of these events (for example, entry to school) are planned, others (for example, separation of parents) are not. Information on these events will be collected at each data collection point.





3 Specific research questions

This section discusses the specific research questions for the Longitudinal Study of Australian Children as posed by the Department of Family and Community Services, and how the LSAC Consortium intends to address them. The questions are grouped under broad content areas, which reflect the particular portfolio interests at Commonwealth level.

The broad areas covered in this section are:

- Family functioning
- Health
- Non-parental child care
- Education
- Cross-discipline
- Summary of data collection

The breadth of the questions implies a considerable amount of data collection. To address the questions satisfactorily we intend to follow the approach outlined here. However, the Consortium recognises that to stay within the allocated budget, and to avoid over-burdening respondents, some cuts to the proposed data collection may have to be made. It is already clear that some research questions cannot be comprehensively addressed within the current design and funding. For these, possible *enhancements* to the study design are suggested. Developmental work conducted during Stage One will establish the feasibility and costs of these potential enhancements.

It will be apparent that the division of specific research questions into content areas is to some extent artificial. Many of the questions involve common input variables and child outcome measures, whether the “topic” of the question concerns health, education, child care, or family functioning. The data collected will allow for modelling of complex interactive pathways between the factors (at all levels of the child’s environment) and child outcomes.

Family functioning

RESEARCH QUESTIONS

Families make a major contribution to the health and wellbeing of individuals across their lifespan, from conception to old age (Mrazek and Haggerty 1994). Supportive, nurturing family environments provide the foundation for the development of competence, self-esteem and well-regulated behaviour. In addition, there is a range of family factors that may impact *adversely* on the development, health and wellbeing of children and young people (Fergusson et al. 1989; Fergusson et al. 1990).

It is becoming increasingly evident that aspects of intra-family processes (such as parent-child relationships, parenting practices, and inter-parent conflict) are important mediators of the impact of family structure and of the family's broader socio-cultural context (Sanson and Lewis 2001). Connections between child and family functioning are complex, dynamic and bi-directional. Parents react to their children's characteristics (Hemphill 2001; Patterson et al. 1989), just as children are affected by their parents (Lamborn et al. 1991; Smart and Sanson 2001).

In this section, we outline how it is intended to address each of the six key research questions in the family functioning domain.

Key Research Question 1

What are the impacts of family relationships, composition and dynamics on child outcomes, and how do these change over time?

Including:

- size and make-up of family (for example, step or non-resident parents);
- involvement of extended family and/or other family members;
- roles of family members in relation to child;
- character of parental relationships (including non-resident parents), including level of conflict, parenting practices, values and skills, and parents' confidence in applying them;
- child's temperament;
- impact of family break-up and re-formation; and
- family coping strategies, particularly in times of stress and conflict.

Families in Australia have undergone substantial changes which are of significant social and economic concern. For example, parental separation is often associated with a movement into poverty for women and children (Smyth and Weston 2000), increased chances of receiving income support payments, and psychological impacts which lead to a high rate of use of mental health services. While remarriage may provide a route out of poverty, living in stepfamilies provides other challenges, with stepfamilies consistently being found to be associated with a range of poorer outcomes for both children and adults (Nicholson et al. 1999; Cowan et al. 1991). While there are a number of international longitudinal studies of families, the lifecourse profile of Australian

families may be very different from those in other countries, and therefore a study of Australian families is of critical importance.

The Longitudinal Study of Australian Children will provide both a *snapshot* of current family structures at any given time, and a *life course perspective* on the types and timing of various family transitions. The data obtained will include the proportions of children living in different family types, the stability of these families over time, and the typical trajectories of families through transitions such as separation, divorce, cohabitation, remarriage and re-divorce across the lifecourse.

The study will also examine the role of family functioning or processes, over time and interactively, to determine the extent to which these vary within the population, and their impact on child developmental outcomes. Growing evidence suggests that family structure and transitions per se may have a relatively minor influence on child developmental health outcomes when compared to the role of family functioning (Sanson and Lewis 2001). The literature on parental divorce, for example, indicates that family conflict (both prior to and after divorce), parent–child relationships, financial hardship, and parental psychological distress and substance use have a greater impact on child developmental health outcomes than the divorce transition itself (Pryor and Rodgers 2001; Rodgers and Pryor 1998).

Finally, as noted above, development is a bi-directional process, with the child making important contributions to her/his own development. While cognitive and physical attributes of the child are important factors here, the child's temperament is increasingly being seen to impact on the process of development. This occurs not only directly (for example, the highly reactive child is more likely to develop acting-out problems), but indirectly through its impact on parenting and parent–child relationships (for example, high reactivity can elicit harsh parenting), and through the match between parenting and child characteristics (for example, the interaction of harsh parenting and high reactivity is particularly likely to lead to externalising problems) (Sanson et al. in press). Hence child temperament needs to be considered in modelling pathways.

To address Research Question 1, data will be collected from the primary caregivers. Measures on critical aspects of family functioning, including couple, parent–child, and sibling relationships, parenting practices, child temperament, and contact and support from wider family members, as summarised in Table 1, will be collected largely during the face-to-face interview in the home, possibly supplemented by a mail-back questionnaire.

Data from the secondary caregiver will shed important light on the role of fathers in two-parent families (discussed in more detail under Research Question 2), and the extent to which the roles and adjustment of both parents *interact* to influence children's outcomes. The results will have important implications for the provision of preventive parenting interventions, and in particular will provide insights regarding the potential benefits of including both parents (in intact families) and non-resident parents and step-parents (where separation or repartnering has occurred) in these programs.

Enhancements

The base design would be further enhanced by the collection of data from extended family members. The extent to which extended family members provide ongoing moral and practical supports to young families in modern Australia is poorly understood. If extra funding were to become available, LSAC

could be expanded to investigate the extent to which grandparental involvement (a) is affected by geographic distance and by disruptions to the middle generation arising from such things as parental separation, work demands and remarriage, and parental psychological and substance (including alcohol) abuse problems; and (b) impacts upon child wellbeing. Assuming an adequate final sample size, additional funding would also allow exploration of the role of extended family and the broader community in child-rearing in Indigenous families and different cultural groups.

Observational measures of family functioning (such as parent–child interactions) provide important information that may be less reliably assessed through self-report. Observational data collection and coding of data is of course expensive. While the Consortium will explore opportunities to include some simple observational assessments, more comprehensive observations will be beyond the current funding for the study. However, should additional funding become available, this would be a valuable extension to the design (with data possibly collected from a sub-sample of the LSAC cohorts).

Key Research Question 2

What can be detected of the impacts and influences of fathers on their children?

Past longitudinal studies have focused on the role of one parent in the family (typically the mother), assuming that the influences on children are either similar for both parents or alternatively, that fathers have a lesser influence on child development and wellbeing than do mothers. Moreover, there is an implicit assumption in such studies that mothers' perceptions accurately reflect the family environment, and that fathers' perceptions are thus redundant.

Changing family structures where many biological fathers live separately from their children, and where unrelated adult males (stepfathers) may have a significant child-rearing role, challenge these assumptions. There is increasing evidence that fathers contribute to child outcomes in a variety of ways (Pryor and Rodgers 2001). First, in intact original families, there are direct influences of fathering on children's development and wellbeing through their degree of engagement and involvement in child care. Second, fathers have an indirect influence on their children through their relationship and interaction with their spouse or partner. The style of parenting within a family often arises from the joint contribution of both the parents involved. Furthermore, studies of non-resident fathers indicate that it is not so much the amount of contact between children and non-resident parents that is important, but what the parents actually do when they are with their children (Amato and Gibreth 1999). In stepfamilies, children's wellbeing appears to be encouraged by supportive parenting by stepfathers (that is, warm but not controlling). This may, in part, be due to the continuing relationships children often have with their biological fathers.

While evidence from the small amount of research that is available suggests that children are able to benefit from close relationships with both biological fathers and stepfathers, the interactions between these relationships clearly deserve further elucidation. In addition, little is known about the changes that occur in father's involvement with their children across major life transitions, including separation, remarriage and changes in employment status.

There is also growing evidence that family roles may be important to the health and wellbeing of fathers. This is an area which has been under-researched. Studies examining fathers' adjustment after separation indicates that a proportion of fathers experience considerable loss due to their changed parenting roles with negative emotional outcomes including grief, depression, and alcohol and other drug use (Jordan 1998; Rodgers 1995). Both mothers and fathers show adverse changes in the aftermath of separation and this can be long-term as well as short-term, but the nature of their reactions and the factors influencing these appear to differ for men and women (Amato 2000; Hope et al. 1999; Power et al. 1999). Some fathers, however, report that their role as single parent, even though it may be restricted to weekend contact, has made them more involved with their children and has led to improvements in their mental health and health care behaviours (McKeering et al. 2000).

The extent to which post-separation parenting impacts on the health and wellbeing of fathers, the relationship between this and children's outcomes, and the association with ongoing conflict with ex-partners has received little investigation (Pryor and Rodgers 2001). This is an important research question that will inform the development of effective family policy that meets the needs of all family members.

By examining a range of issues relating to the influence of fathers on children's development and health, LSAC will make a valuable contribution to the international evidence base in an under-examined area (West et al. 1998). Besides the measures of family structure, transitions, and functioning (discussed under Research Question 1), and workforce participation (discussed further under Research Question 3), this question will require data on direct and indirect paternal influences. Indirect contributions may include fathers' provision of affection, warmth and support to their partners, and in the case of separated parents, contributions to the parenting relationship. More direct influences include fathers' parenting roles, beliefs and practices, and some specific paternal characteristics (for example, mental health).

Enhancements

The base design for LSAC could be enhanced by the collection of observational measures of father-child interactions. However, this would require additional funding.

Key Research Question 3

How are child outcomes affected by the characteristics of their parents' labour force participation, their educational attainment and family economic status, and how do these change over time?

Including:

- What are the impacts of the family's experience of poverty or perceived income inequality?
- How do workforce status and conditions of work affect family functioning and child outcomes?

There have been a number of changes in the labour market which impact upon Australian families. These changes include the massive increase in the rates of labour force participation of women (particularly women with

children), falling male employment, the advent of high rates of unemployment and under-employment, and the growth of part-time and casual employment with a simultaneous increase in rates of over-employment. These new patterns of employment are occurring within a climate of broader social change (such as economic restructuring and globalisation). Perceptions are widely held that parents are finding it harder to combine work with family commitments (Russell and Bowman 2000), that some families are disproportionately bearing the brunt of social and economic changes, and that both of these difficulties are adversely impacting on children's academic and behavioural outcomes (Lewis et al. 2001; McCain and Mustard 1999).

The influence of parental employment patterns on children's development and wellbeing requires clarification. Maternal employment has been found to influence different developmental outcomes differently, with both positive and negative effects reported, and with outcomes varying by child gender (Amato 1987; Evans and Kelley 1995). However, little attention has been given to the mechanisms that might explain such trends.

It is known that poverty and material deprivation have negative and accumulating effects on children's development (Keating and Hertzman 1999). Poverty may affect children's wellbeing via deprivation of material resources (income, housing, nutrition, clothing) *and* via psychosocial processes such as perceived inequality, limited control over personal circumstances, social exclusion, and psychological distress (Wilkinson 1999). Labour force participation is not always a remedy for poverty (Apps 1999). Furthermore, while parental employment has been reported to be associated with improved cognitive outcomes for children, in families where employment does not result in greater financial wellbeing, increased rates of child behaviour problems are also evident (Harris et al. 2000).

The links between poverty, parental employment and children's development and wellbeing will be examined in LSAC, with a focus on identifying causal mechanisms and the influences of varying employment and income patterns across the life course.

To address Research Question 3, data will be collected from the primary caregiver. Using the social indicators' framework developed by Zubrick and colleagues (2000), key areas to be assessed will include: labour force status (workforce participation and work history, parent occupation); work conditions (work hours, job security, demand and control, effort and reward balance, family friendly practices); and parent resources (time, income, human capital, financial hardship, and psychological capital, including parent mood, stress and mental health, and the quality of the couple's relationship).

Results will provide contemporary information on the mechanisms by which work and family life in Australia impact on the health and wellbeing of family members, and will have direct implications for policy on family-friendly work practices and welfare reform.

Enhancements

It would be a significant improvement over past longitudinal studies of children if extra funds were obtained to collect more detailed work conditions data from fathers as well as mothers (Nicholson et al. 2002; West et al. 1998). This would enable exploration of the interactions between fathers' work conditions and their parenting roles, and the consequent impact on children.

Key Research Question 4

Do beliefs and expectations of children (parental, personal and community, in particular the parents' and child's expectations of the child's school success, workforce participation, family formation and parenting) impact on child outcomes, and how do these change over time?

The expectations of children held by parents and members of the broader school and local communities are important predictors of children's adjustment and achievement (Keating and Mustard 1996). For example, positive achievement expectations are key environmental protective factors that facilitate successful outcomes for individuals exposed to conditions of high adversity (Patrikakou 1997).

Parental beliefs include beliefs about what the goals of socialisation are (for example, relative evaluations of obedience and conformity versus independence and autonomy), and what competencies can be expected of children at different ages. Differences in such beliefs have been found to impact on children's developmental outcomes and skill acquisition, with their influence often mediated through parenting practices and parent-child relationships. For example, parents' beliefs about reading influence both the extent to which literacy activities (such as shared book reading) occur in the home, and the manner in which they occur (for example, with a focus on the enjoyment of reading as opposed to an emphasis on skills). These beliefs in turn affect the child's motivation to read and their subsequent skill development (Baker et al. 1997; Chall et al. 1990).

Parental support for education, encouragement of planning for the future, and belief in the education ethic are predictors of educational success in disadvantaged and minority populations (Entwisle and Hayduk 1988). However, the multiple interacting mechanisms through which parents' achievement beliefs and expectations operate to influence children's development and skill acquisition require additional clarification.

LSAC will include data collected from parents and children to examine ways in which parents' expectations and beliefs relate to their type and level of involvement in their children's schooling and how these interact with: family sociodemographic factors such as family composition, parental occupation and educational background; parenting and family functioning factors (such as family discord and parenting style); individual parent factors (such as depression and self efficacy in parenting); individual child factors (such as temperament and self-efficacy); and school factors.

Studies of the inter-generational transfer of welfare dependence have argued that important mechanisms in such transfer include the beliefs and expectations that children develop about their own workforce participation (Saunders and Stone 2000). However, as far as the LSAC Consortium is aware, there are no studies which have tested these assertions with prospective longitudinal data. While a full test of this hypothesis would require LSAC to be extended into adulthood, it will be possible to tap children's school achievement and attitudes towards education, work, and their own family formation in later childhood.

Key Research Question 5

How important are broad neighbourhood characteristics for child outcomes? Does their importance vary across childhood? How do family circumstances interact with neighbourhood characteristics to affect child outcomes?

Neighbourhood characteristics include:

- stability and demographics (age profile and income) of neighbourhood; and
- availability, access to, and use of broad level resources and amenities (including health and parental support services).

Community-level influences are increasingly being recognised as important contributors to children's development. Previous research (for example, Brooks-Gunn et al. 1997) suggests that the local neighbourhood most likely influences child development indirectly, with effects being mediated and/or moderated by family and child characteristics. Among the key influences worthy of rigorous investigation are: child care (see Research Question 11); availability, safety and stimulation of parks, playing fields and other amenities; and the parenting practices observed by the child outside the home, for example, in the homes of neighbouring children.

Several approaches are proposed in response to Research Question 5.

First, a targeted set of neighbourhood and community data, such as developmental amenities available (for example, parks with appropriate equipment) will be gathered from participating families.

Second, parents will be asked about their access to and use of key neighbourhood and community services. Measures of parental supervision and monitoring, family organisation and function, and parental self-efficacy will also be included. This is because the home environment is a key mediator of the use of the neighbourhood environment and this mediation must be specified in any causal relationship linking neighbourhood environment to child development outcomes.

Third, census data will be linked hierarchically to individual family level and child level data. These data will give us the capacity to undertake multilevel modelling of small area social, demographic and economic influences on outcomes, and to more clearly describe the effects of mobility on children.

Fourth, it is planned to have a short observation-based questionnaire completed by the interviewer that would allow a basic environmental scan of the neighbourhood at the time of the household interview.

Key Research Question 6

How important are family and child social connections to child outcomes? How do these connections change over time and according to the child's age? Does their importance vary across childhood?

More specifically:

- How engaged are children in non-family social structures and institutions such as sports or church groups? How does this engagement relate to child outcomes?
- How connected are families to wider social networks and community level resources, including schools and preschools? How does this connectedness relate to child outcomes?
- What factors determine the family's use of the range of services available?
- How do families perceive their neighbourhood, including perceptions of levels of community connectedness, trust, crime, and violence? How are these perceptions related to engagement and connectedness, and to child outcomes?

Research Question 6 revolves around the significance of social capital to children and families. Central to this question is the belief that social “connections,” “networks” and “structures” (here referred to collectively as *social resources*) outside of the immediate family are instrumental to child outcomes (see also Research Question 5), with schools being particularly important (see also Research Questions 12 and 13).

The use of these social resources can be differentiated by at least three dimensions: first, where they occur; second, who participates and the extent and form of this participation; and third, the rights and obligations that are understood to govern them (Goodnow 1995). Social connections are thought to reflect both the ongoing process and developmental outcomes of *attachment* (Pietromonaco and Barrett 1997), and as development progresses these connections may be seen in the form of companionship, affiliation, connectedness (Lee and Robbins 1995) and belongingness (Kohut 1984). Some practical examples include the establishment and maintenance of close relationships; the extent and use of social kinship and friendship networks of families and their individual members; participation in hobbies, sports, and clubs; church participation; and civic involvement. Finally, social resources interact with such personal resources as self-reliance, self-understanding, empathy, altruism and self efficacy (Bandura 1994). This network of cause and effect has been shown to moderate the negative effects of stress and to prevent or reduce mental health problems (Moen and Erickson 1995).

From a general health perspective, social connections have also been shown in cross-sectional studies of Australian children to correlate with children’s general health and wellbeing (Waters et al. 1999). The bi-directional nature of these associations needs to be examined, as individual child factors (such as health) may facilitate or inhibit social connections and the desire to seek out social supports. To address the research question satisfactorily, the contents and processes of the connections that influence specific developmental outcomes, as well as the quantity of these connections or networks, need to be measured.

Our principal measures of social resources will include: the presence/absence of a close relationship; the extent of connectedness (social bonds and multiple role occupancy); relationship quality with family, friends and peers; the acquisition and use of support networks (this includes key services); and participation in neighbourhood and community activities.

It is planned to measure multiple levels of social resources – that is, for the children, the families (principally the primary carers), the children’s peer groups, and the wider community (through parent reports). As children reach late childhood, child self-report measures will be introduced. In addition, information on other causal mechanisms of social capital will be gathered, including data on: neighbourhood reciprocity and mechanisms to help parents care for and keep track of children; levels of perceived police protection; and parents’ perceptions of neighbourhood safety, street violence and substance abuse.

We propose to use *resilience* as one of the key outcomes. Resilience is related to access and use of social resources (Moen and Erickson 1995; Werner 1990) (Moen and Erickson 1995; Werner 1990). Our social resource model seeks to better

understand the causal determinants of resilience, and so we intend to measure aspects of resilience in the child and parent. These measures of resilience will principally include the child dispositions of: self-regulation and self-efficacy (Cowen et al. 1991), empathy, altruism, values and priorities (Schaefer 1992)(Schaefer and Moos 1992). Some of these measures may be appropriately collected at the level of the school. The resulting data will have numerous practical implications at the policy and service provision level.

Health

RESEARCH QUESTIONS

There is growing evidence that the wellbeing of children and families is unacceptably poor and, in some areas, is becoming worse (Booth et al. 2001). Major areas of concern, all of which have lifelong implications and incur substantial, if incalculable, costs, include: childhood overweight and obesity; atopic diseases (such as asthma and eczema); preventable injuries (such as falls, burns, poisonings; harmful health behaviours (such as cigarette smoking and sun exposure); chronic conditions (such as juvenile diabetes, myopia); and other chronic diseases (such as cancer and cystic fibrosis). (Mental health problems such as depression, aggressive behaviours and attention deficit problems are covered in Research Question 8.)

The long-term impact of our rapidly changing society on the lifetime health of children and young people is not well understood. Research is needed to identify the complex interactions between the resources of individuals and their families, the pressures exerted by their environments and social structures, and how these factors together determine the wellbeing and health of future generations of Australians. Such information will be essential for developing social, health and other policies and preventive services to encourage the full participation of young people and families in community life.

Key Research Question 7

What is the impact over time of early experience on health, including conditions affecting the child's physical development?

Including:

- exposure to stress, including *in utero*;
- *in utero* exposure to drug/ alcohol/ tobacco;
- low birth weight or other indicator of poor intra-uterine development;
- nutrition (including breastfeeding);
- immunisation;
- experience of chronic illness or injury;
- parental mental disorders, especially maternal depression;
- character of child's emotional attachment to other humans.

To address this Research Question, we propose to study the early antecedents of health outcomes that pose immediate and long-term threats to healthy development. For example, we know about some of the harmful long-term effects of prenatal and postnatal exposure to cigarette smoking, alcohol misuse and other drug use, and sun exposure. What impact have recent efforts to reduce these exposures had on the health of Australian children? What impact have changes in the patterns of “recreational” drug use had?

LSAC plans to assess these in light of new knowledge about child development and its determinants. Patterns in health risk behaviours will be explored within the context of the family, the couple relationship, and in relation to workforce and employment factors. Necessarily, some measurements of parental health

risk behaviours (such as maternal substance use during pregnancy) will require retrospective reports.

As noted above, childhood overweight and obesity has become a critical health issue in Australia, with the prevalence of childhood obesity having doubled since 1985 and apparently accelerating (Booth et al. 2001). Perhaps the most serious secondary outcome of childhood overweight and obesity is the early development of precursors of Type II diabetes. The size of this threat to health in Australian children needs to be assessed, and possible causes explored.

The impact of aspects of infant and toddler nutrition also needs to be investigated. It is already known that breastfeeding is positively associated with later child cognitive outcomes (Pollock 1994), and protective against the development of later obesity and asthma in Australian children (Oddy et al. 1999). There is emerging evidence that an early diet that is high in polyunsaturated fats such as margarine may increase the risk of asthma in Australian children (Haby et al. 2001). However, there is much about early nutrition that has not yet been studied, and LSAC provides an opportunity to make a contribution to knowledge in this area. While the collection of detailed nutritional data will be beyond the scope of the study, brief measures of food practices, especially the timing and nature of the transition from breast feeding to solid foods, will be trialed in Stage One.

The study will also explore the complex mix of interacting factors involved in forming and maintaining attachments. The child's emotional attachment to other humans, especially parents, is critical for healthy development (in both physical and emotional domains). Whereas earlier research has tended to focus simply on individual variables and their effects, we plan to collect data that will support analysis of the impact of *relationships* between the key factors on the child's health and development.

Additionally, LSAC offers the opportunity to prospectively study the relationship of *parent* wellbeing and chronic conditions in early childhood. Parental psychosocial problems to be examined include antisocial behaviour disorders, depression, somatic complaints, and alcohol and drug abuse. While some impacts on children of maternal depression have been relatively well studied, and while there is growing evidence of the associations between parental alcohol and drug abuse and a range of poor child outcomes, the causal influences involved are poorly understood, and may be mediated through changes in parenting behaviours and parent-child interactions (for example, Downey and Coyne 1990; Sanders et al. 2000).

A broad range of data will be collected, mainly through retrospective parent report, to explore early life influences on later physical and socio-emotional health. We also plan to investigate the feasibility of interviewers taking some basic direct assessments of the child (such as weight and height) at the face-to-face interview.

Enhancements

As already noted, data concerning prenatal, birth and other early health-related variables will initially be limited to retrospective parent report. Ideally, data on all predictor variables should be collected prospectively, rather than retrospectively, since this avoids problems with missing data (due to forgetting) and with recall bias (which can seriously disrupt data integrity). The use of

retrospective data collection with Cohort 2 (recruited at four–five years of age) is unavoidable, and means that some data collected on early life influences will need to be interpreted cautiously. Data linkage to medical or hospital records could be a useful addition to improve data reliability. Response rates for informed parental consent to such data linkage, and any impact on sample recruitment and maintenance will be investigated in the development phase.

A related issue relates to the depth of data to be collected. It would be preferable to obtain direct health assessments, rather than parent reports, for example, for assessment of children’s physical fitness and respiratory function. However, such data collections are expensive and would require data collection by trained health staff. Additional funding would be required for this.

Key Research Question 8

What is the impact on other aspects of health and other child outcomes of poor mental health, including infant mental health and early conduct disorder? How does the picture change over time?

The high prevalence of mental health problems among children and adolescents is a source of considerable concern. One in five children and adolescents in Australia suffer from serious problems such as conduct disorder, depression or anxiety (Sawyer et al. 2001; Zubrick et al. 1995), and there are high rates of suicide amongst those aged 15–24 years (Harrison et al. 1998). Mental health problems are associated with a range of other adverse outcomes, including continuing behavioural and emotional problems, relationship difficulties, impaired educational and occupational outcomes, and engagement in criminal activities. At a societal level, these problems are associated with significant costs through demands on health, mental health, special education, justice, and welfare services. Interventions addressing the prevention of mental health problems have shown very substantial cost savings across childhood and adolescence/early adulthood that span a range of service portfolios (Karoly et al. 1998).

Considerable gains have been made in understanding the determinants of children’s mental health problems (for example, Kazdin et al. 1997; Loeber, 1990; Marshall and Watt 1999; Fergusson et al. 1990; National Crime Prevention 1999; Prior et al. 2000). These determinants include a range of interacting factors, such as the circumstances into which a child is born (child genetic make-up, family socioeconomic conditions), interpersonal interactions and functioning within the family (parenting practices, family conflict), and the quality of the child’s broader environment (peer group relationships, supportive school environments). Family factors are noted to be among the strongest predictors of negative mental health outcomes for children in the early years and during primary school (Richman et al. 1982; Patterson 1996; Rutter et al. 1997). Children’s risks for developing a mental health problem increase cumulatively with increasing exposures to risk factors across the life course (Fergusson et al. 1994; Sanson et al. 1991). Protective factors are less well understood, but are thought to include individual attributes (such as an “easy” temperament, strong interpersonal skills and competencies) and the extent to which children have access to supportive and caring environments (National Crime Prevention 1999; Werner and Smith 1982).

Despite these gains in our understanding, a number of important questions having significant policy and service provision implications remain to be explored. Three key issues will be explored in LSAC, in relation to children's mental health.

The first issue concerns the relationship between children's mental health very early in life, and later outcomes. Infant mental health will be examined in relation to concurrent maternal psychosocial problems (such as depression), early language problems, child temperament, and interactions with parenting behaviours. In addition, we hope to disentangle the complex pathways that lead to later deficits in mental health, communication and social skills.

A second area of children's mental health that will be explored in the study concerns the developmental pathways leading to "internalising" problems such as anxiety and depression. Relatively few longitudinal studies have examined the development of these problems across the early years. However, it is important to investigate childhood internalising problems because they tend to persist over time and appear to be linked to a range of adverse later life outcomes if left untreated (Ollendick and King 1994; Prior 2000). LSAC will aim to assess early signs of internalising disorders and will study risk and protective factors for their development. This will be valuable in informing the content and direction of future preventive interventions and service delivery models.

Finally, LSAC will attempt to identify some of the key individual, family and broader socio-environmental factors that provide protection against the development of mental health problems. Many children are exposed to a range of adverse risk factors over the life course, and yet only a minority develop mental health problems (Goodyer et al. 1990; Loeber 1990). Currently, our knowledge regarding protective factors lags a long way behind what we know about risk factors. It is unrealistic to eliminate many traumatic and negative life events. Therefore, information about how protective factors and resilience in children might be enhanced will make an important contribution to the development of interventions designed to reduce these problems and their associated costs.

Data pertaining to a broad range of potential factors (individual child and parent, family, and broader social and environmental factors) that may influence children's mental health outcomes will be collected. In addition, outcomes data will be collected from multiple sources (parents, child care providers and teachers) from early in life.

Key Research Question 9

How do socio-economic and socio-cultural factors contribute over time to child health outcomes?

The lifelong patterning of social, cultural and economic circumstances has an important impact on health and wellbeing (Blane 1999). Health status may even be shaped by the intergenerational transfer of social, cultural and economic capital (Najman forthcoming).

The pathways by which *socio-economic factors* affect child health are thought to be both direct, via the availability of good nutrition, health services and developmental child care; and indirect, via the psychological and physiological responses to stresses in the social and physical environments.

The pathways by which *socio-cultural factors* affect health are less clear. One point along the culture–health pathway is social status. Stigma arising from membership of particular social and racial groups has been clearly associated with differential health status (Williams et al. 1997), and living in areas that have a negative reputation can be injurious to health (Macintyre and Ellaway 2000). Cultural factors also contribute to determining the values and behaviours of individuals and groups (Corin 1994; Helman 2000). Risk factors, like drug and alcohol abuse, obesity and a sedentary lifestyle, all have a strong cultural component, as do the behaviours which make up child-rearing, social support and trust. For example, religious beliefs and values have been linked to child mortality differences in a study of immigrant groups to North America in the early 20th century (Condran and Preston 1994).

LSAC provides a unique opportunity to explore how social, economic and cultural variation impacts on child care practices, family functioning, and children’s health and wellbeing. A range of factors will be measured across the early years, supporting research around Research Question 9. As described in more detail in other sections of this paper, these factors will include core demographic variables, parenting beliefs and expectations, neighbourhood characteristics, and the ethos of key child-rearing environments such as schools and child care settings. The predictive roles of these variables will be assessed in relation to the health outcomes listed in Table 1. The information gathered will be able to inform future service provision and policy decisions.

Enhancements

The collection of data in the base design will allow for the exploration of the associations between socio-cultural identities and parenting practices and family functioning based on self-report measures. An additional qualitative interview with a sub-sample of respondents, possibly selected on the basis of their response to base design data collection, could be used to further investigate the specific details of ethnic, religious and cultural influences on parenting practices and family forms and functions. These could be linked later to the child health and developmental outcomes collected. These data would provide important additional information in an area that is currently poorly understood.

Key Research Question 10

What are the patterns of children’s use of their time for activities such as outdoor activities, unstructured play, watching television, reading; and how do these relate to child outcomes including family attachment, physical fitness level and obesity, social skills and effectiveness over time?

This Research Question requires measurement of children’s time use. In the last half of the 20th century, the ways in which parents and children spend their time changed dramatically. These changes include: the curtailment of children’s outdoor play activities due to decreasing availability of home outdoor play space, and concerns about children’s safety when unsupervised in public places; the decrease in walking or biking to and from school and recreational activities; the increased presence of TV, video games, computers, and labour-saving devices in the home; and altered parental work patterns.

Family size has decreased dramatically, possibly playing a further role in the reduction of children’s active play and influencing outcomes such as poor

physical fitness. Since 1985 an epidemic of child obesity has occurred (Booth et al. 2001), well after the near-universal addition of televisions to Australian homes.

Research shows that time-use diaries are a valid and reliable method of collecting accurate information about the way people allocate time to different activities, including physical exercise, passive leisure time (for example, television), and in social contact with parents, relatives and peers. Consortium members have recognised expertise in the diary measurement of time use (Baxter and Bittman 1995) and will apply this to the novel question of outcomes of early time use. However, this method does impose a significant burden on the respondent. An efficient way to collect adequate data, subject to costings, will be investigated in Stage One.

Enhancements

This Research Question specifies the measurement of several outcomes including obesity and physical fitness. As noted under Research Question 7, optimal measures of these would entail direct assessments, which will not be possible within the current budget.

Non-parental child care

RESEARCH QUESTIONS

Women's increased participation in the workforce (approaching 50 per cent of mothers with children under four years in 1997) has been matched by similar increases in the provision and use of non-parental child care by Australian families (261,100 funded places for children under five years in 1996). Of this, the most noticeable expansion has been in the demand for child care for children under two years of age. This widespread early experience of non-parental care has raised concerns about the possible long-term effects on children's development.

Much of the research into the long-term impact of non-parental child care has been predicated on a model of risk. Initially, this model centred on the belief that regular separations of mother and child during infancy would disrupt the pattern of responsive caregiving that lays the foundation for secure attachment and later social competence (Vaughn et al. 1985). Separations of mothers and infants were felt to reduce maternal caregiving ability (Brazelton 1986), to increase anxiety in the relationship (Belsky 1988), or alternatively, to render the infant less sensitive to the stresses of separation (Clarke-Stewart, 1988).

More recently, there has been an attempt to define which characteristics of the child care experience pose the most significant risk for children. However, results have been found to be mixed, with both benefits and problems being reported, and to vary with: the specific aspect of child care under consideration (quality, quantity, stability, type, age of entry) (Belsky 1988; Harrison and Ungerer 1997; Howes 1990; Scher and Mayseless 2000; Vandell et al. 1988); the domain of child outcomes being considered (cognitive, social-emotional, behavioural); and the age at which outcomes are assessed (NICHD 1998, 2000, 2001a and b). In addition, it has become apparent that in order to understand the impact of non-parental child care on children's development, the broader family and socio-cultural context must also be considered.

Characteristics of child care must be understood within the context of other often correlated risk and protective factors. For example, child care choices have been found to be affected by a complex array of factors which differentiate families. These include: family finances (Wolcott and Glezer 1995); family social class and marital status (Vandell and Corasaniti 1990); levels of stress or support in the family; maternal psychological wellbeing; and quality of the marital relationship (Richters and Zahn-Waxler 1988). These factors have also been identified as important variables which directly influence the quality of maternal caregiving, irrespective of child care (Belsky and Isabella 1988; Bronfenbrenner and Crouter 1982; Bronfenbrenner et al. 1984) and may, therefore, explain the associations between child care and child outcomes.

Key Research Question 11

What is the impact of non-parental child care on the child's developmental outcomes over time, particularly those relating to social and cognitive competence, impulse control, control of attention and concentration, and emotional attachment between child and family?

Within care history, how important are:

- multiple care arrangements and changes in care arrangements;
- age of child on entry to care; and
- type of care, including centre-based care, family day care, after school care, and informal care?

Studies of the impact of child care on children's development have reported long-term effects for child care quality, quantity, and changeability, while age of entry to care by itself has not been associated with either positive or negative effects (NICHD 1997).

Research has consistently reported enhanced outcomes for children in high quality child care, and poorer outcomes when child care quality is low. Measures of quality typically include structural features of child care settings (child-staff ratio, staff qualifications), and process features (caregiver's sensitivity to the child's distress and non-distress signals, intrusiveness, positive and negative emotional responding, stimulation of cognitive development). Research has confirmed that when child care standards are variable, child outcomes, particularly in cognitive and language areas, are clearly related to variations in quality of care (NICHD 2000, 2001 a and b; Harrison and Ungerer 1997, 2000).

One important aspect of quality in child care is the nature of the carer-child relationship. Secure relationships with teachers have been found to predict peer competence and pro-social behaviour in preschoolers (Howes et al. 1994) and to protect children from poor school performance (Lynch and Cicchetti 1997). Little is known, however, about the structural factors within child care services that promote secure attachment relationships.

A further issue concerns the effects of the amount of time a child is in child care, particularly in relation to children's later social competence and vulnerability to the development of behaviour problems in the toddler and preschool years. The NICHD group (2001) reported a relationship between time spent in non-maternal care and behaviour problems, with problem behaviour increasing as quantity of care increased.

To address this Research Question, data on child care use will be collected from the child's primary parent during the home interview. Key factors that will be assessed include: the number of hours per week the child receives care; the number and type of care services received; the stability of care arrangements; the child's age of entry into care; and broad indicators of quality of care.

In addition, we intend to provide a more comprehensive picture of the impact of child care on children's developmental outcomes by using reports from child care providers (via mail-back questionnaires and telephone interviews) at appropriate ages. This will allow for more accurate and differentiated indices of care quality (including measures of the carer-child relationship) and stability (same setting

but different carer). In addition, carers could provide independent assessments of children's social-emotional and cognitive-communicative competencies, and of the incidence of behaviour problems as they are displayed in a large peer group context outside the family. Supplementing parents with carers as respondents will greatly improve the reliability of the assessment of child outcomes.

LSAC will contribute to child care policy in several ways. It will: establish a unique and comprehensive database on Australian child care; allow a large-scale replication of both positive and negative outcomes found in overseas research; and explore Australia's different cultural context in full, including urban, rural and regional child care settings.

Enhancements

With enhancements, the Longitudinal Study of Australian Children could also explore the processes underlying the positive and negative outcomes of child care that have been reported in the literature. For example, as noted above, poorer behavioural outcomes for children in longer hours of care have been found. However, it is not clear why this effect occurs. Is it because families with children in long hours of care also work long hours themselves, resulting in a family context that is generally more stressed and with fewer emotional resources to support the care of children? Or is it a function of particular influences in the child care context itself? Answers to these questions could inform government policy aimed at supporting the development and functioning of families and children.

While the LSAC design enables good measures of family functioning to be obtained, more detailed information about child care is required to satisfactorily address these issues. Direct observations of the physical child care environment and of child-carer and child-peer interactions in these settings would be optimal. Adequate data to address these issues could be obtained from a selected sub-sample of participants. Further funding may be required to do this.

Education

RESEARCH QUESTIONS

Children's readiness to learn is supported by the capacity of families to participate in, and support, the education of their children. This capacity is a product of different family and community resources and circumstances (Zubrick et al. 1997). Important influences on children's early learning are the characteristic patterns of family interaction and activities. The relative strength and importance of these influences may change over time, requiring longitudinal study. In the Australian context, there has been little research that has comprehensively explored the impact of a range of child, family, and community factors, or the interaction between them, on children's early school adjustment and achievement.

Although factors such as parental education and family income are known to impact on children's educational achievement, there is a need to explore the influence of other family variables, such as: the everyday practices within families; the nature of parental involvement with their children; and families' engagement within communities (Bronfenbrenner 1979). The relationships between features of home and community environments, and the consequences for children's school adjustment and educational achievement, have not been extensively examined in Australian research and have been under-researched in international studies (West et al. 1998).

Key Research Question 12

What early experiences support children's emerging literacy and numeracy?

- How much and what type of communication occurs between children and their parents/carers?
- What is the impact of the child's exposure to books, storytelling and other literacy-related experiences at home/in care/in pre-school or other children's service?
- What factors (child, family, community) impact on early learning?

Early learning is a complex process dependent on children's life experiences within their social and cultural context, as well as the opportunities afforded in those contexts to support learning. Across the years prior to school, children's learning is influenced by: their physical health and wellbeing; temperamental factors, especially attention and persistence; their developing social knowledge and social competence; and their cognitive and language skills. Once children reach school, characteristics of the school environment are also critical. The relationships the child forms with teachers and peers, the "family friendliness" of the school (for example, the nature of the relationships between parents and teachers), and how well the child's needs are met, all contribute to child outcomes.

The study provides an important opportunity to develop a profile of Australian children's readiness to learn when they enter school, to identify predictors of readiness, and to investigate the impact of school environments on children's subsequent learning.

A set of five key indicators for measuring social and family functioning related to childhood wellbeing, with reference to academic competency, has been identified (Zubrick et al. 2000). The set comprises human capital, psychological capital, social capital, income and time. The factors measured by these social indicators are significant predictors of children's school adjustment and achievement (Zubrick et al. 1997; Ryan and Adams 1998), and include socio-economic status, social support, mental health of the caregiver, levels of family dysfunction, and parenting style.

Family environments influence children's later educational achievements. Important factors to take into account within LSAC include the qualities of home environments (for example, availability of age-appropriate educational toys and materials); family functioning (for example, cohesiveness) and family organisation (for example, consistency in home routines); parenting practices (for example, inductive versus authoritarian parenting style); as well as parental involvement (for example, reading to and with children). This latter factor is presumed to affect language development and, hence, early literacy competencies. Responsive parents use more elaborated expressive language and more complex language forms (Martini 1995), and how parents engage with children around shared activities constitutes another important variation in children's early learning. While there is some Australian research on children of school age on these issues (for example, Rowe 1991), further research with younger children is warranted.

Within the Canadian National Longitudinal Study of Children and Youth, higher use of educational resources in the community has been found to be a positive predictor of young children's behavioural and social adjustment. Readiness to learn, as rated by teachers, positively related to higher family engagement in the community and negatively related to parental perceptions that there were many barriers to community participation (Connor 2001). The impact of communities on children's early learning has not been explored in Australian longitudinal research and LSAC can address this need. Community factors that may impact on children's learning include the cultural and socioeconomic diversity within the community, neighbourhood safety, and level of residential mobility.

Focus areas for data collection in relation to Research Question 12 are:

- expectations for the child's development and education;
- parent-child involvement (such as shared activities within the home, in the neighbourhood and community);
- parental report on child's language competence;
- frequency of verbal interactions between parent and child (such as playing games, talking, reading books and telling stories);
- family organisational capacity (such as consistency in home routines);
- home literacy and educational resources;
- parental perceptions of, and engagement in, community and neighbourhood activities;
- child participation in out-of-home early education programs and activities; and
- child characteristics (such as readiness to learn, health, developmental stage, cognitive and language skills, temperament, behavioural adjustment, and social skills).

Data will principally be collected from the primary parent. While there may be some variation in the measurement of the identified constructs according to the age of the child, essentially similar constructs will be measured for the birth cohort and the four–five-year-old cohort.

Enhancements

The quality of information collected under the base design would be improved if detailed diaries of time use for children’s and family activities, within and outside the home, were included for both cohorts from the age of four years onwards. This design enhancement has already been discussed in relation to Research Questions 7 and 10.

In addition, some of the key variables (for example, child’s language competence and parent–child verbal interactions) may not be readily assessed through self-report questionnaires. Use of observations and direct assessment may provide the most reliable and valid approaches, but may not be able to be accommodated within current funding. Consideration of these potential methods of data collection will be undertaken during Stage One.

Key Research Question 13

What factors over the span of the early childhood period ensure a positive “fit” between child and school and promote a good start in learning literacy and numeracy skills in the first years of primary education?

- What is the nature of the child’s transition to primary school?
- What are effective ways of supporting children through these transitions?
- What are the child, family, cultural and school factors that affect connections and disconnections between child and school?
- Are there effects on transition and outcomes from attending pre-school or other formal early childhood service prior to school?

The transition to school is a crucial period for children in relation to school success. In the early school years, children need to develop positive attitudes to school and to have experiences that promote academic, behavioural and social competence. Children’s successful transition to school is determined by the quality of interactions and relationships across key developmental contexts such as family and school; by the characteristics of the child (Goswami and Bryant 1991; Martin 1989; Sanson et al. 1996); and by the expectations of teachers in catering to children’s individual differences (Rimm-Kaufman et al. 2000). Pre-existing risk or protective factors related to children’s developmental status or family circumstances affect transition experiences. As well, the transition may result in the expression of new risk or protective factors. Further, children’s early success or failure at school can have a significant impact on their later social and psychological development (Prior et al. 2000). The Longitudinal Study of Australian Children will allow the tracking of risk and protective factors across the early years to ascertain their impact on child adjustment and school learning.

At the transition to school, each family begins a new relationship with a school and/or teacher. Over time, family–school connections stabilise. Relationships may be either engaged or disengaged and the qualities of these relationships have consequences for children’s learning (Rimm-Kaufman and Pianta 2000). Family–school relationships can be understood by examining the nature and

frequency of contacts, and parents' and teachers' perceptions of the success of the transition process.

A number of studies endorse the importance of preschool experience to children's school achievement (Early et al. 1999; Entwistle and Alexander 1993). Participation in preschool programs promotes cognitive development in the short term and prepares children to succeed in school. Preschool experience appears to be a stronger positive force in the lives of low income children than more socially and economically advantaged children, so that preschool attendance can help to narrow the achievements gaps faced by children who are disadvantaged, at least in the short term. There is some Australian evidence (Margetts 1999) that children who have attended a preschool program for more than 12 hours per week make a more successful adjustment to school, although this factor may interact with other child characteristics. There is little Australian information on academic progress in the early years of school that draws comprehensively on the earlier experiences of children prior to school entry.

Focus areas for data collection in relation to Research Question 13 are:

- child participation in early childhood education and care programs before school entry;
- factors associated with parental choices about child participation in early education programs, their age of school entry, and the process of school selection;
- child's transition experiences into school (for example, child's happiness to attend school, relationships with teacher and peers, attachment to school);
- nature and frequency of family-school contacts; and
- child characteristics (as for Research Question 12).

Data collection has a particular focus on children aged four years and older, unless otherwise noted. Data will be collected from the primary parent, as well as through teacher reports of children's transition experiences and early school adjustment and achievement.

Enhancements

During Stage One, the LSAC Consortium will investigate the feasibility of, and process for, collecting information on the characteristics of the child's school (school ethos, class size, teaching approach, organisation of program, "family friendliness").

Cross-discipline

R E S E A R C H Q U E S T I O N

The preceding discussions have highlighted the complex, multi-determined nature of children's outcomes. A range of factors has been identified that influence the later development and wellbeing of children. These span individual child and parent factors, parenting characteristics, couple relationships, family structure and functioning, and the broader social, economic and physical environments in which children are raised (Berkman and Kawachi 2000; Keating and Hertzman 1999).

There is now a greater understanding of the complex interactions between these factors, resulting in a move away from notions of single determinants of outcomes, to a recognition of the importance of developmental pathways. It is essential that future research adopts and evaluates theoretical models that examine the interactive and changeable nature of various sources of influence over time. Recent developments in both the measurement technology available to social researchers, and in the statistical methods for analysing complex longitudinal datasets, will enhance the ability of researchers to address these questions (Magnusson et al. 1994; West et al. 1998).

The study will provide a unique data set for Australia, one that captures the breadth of factors that influence children's development and wellbeing, and which will provide a valuable resource for researchers to explore the interactive nature of these factors over time.

Key Research Question 14

What are the interactions among factors in family functioning, health, non-parental care and education that affect child outcomes?

Data collected by LSAC to address Research Questions 1–13 will support attempts to answer Research Question 14. It does not require additional collection of data. Appropriate analysis of all the data will enable researchers to disentangle causal pathways. This will provide insight into the types of strategies and interventions that may be useful for preventing the development of poor outcomes across the early years of life, and provide evidence regarding the broad multi-disciplinary research questions listed earlier in this paper. Answers to these questions will play a significant role in shaping future policy aiming to achieve optimal outcomes for children's development.

Summary of data collection

As noted, the final list of variables to be tapped in the Longitudinal Study of Australian Children will be decided during Stage One of the study. Table 1 provides a summary of the variables currently expected to be measured. Outcome variables are marked O, but note that outcomes at any one time can become predictors at a later time.

Table 1	Summary of variables currently expected to be measured in Wave One of LSAC in 2003
Core measures	Socio-demographic information
	Household – details on all members Family Family structure (parents’ marital status, presence/absence of parent, Step-parent, age and other details of siblings, adoption/foster status) Children’s sex and ages Parental sex and ages Family transitions – nature, timing, number Mobility Parents’ work Work status (full-time/part-time, casual/permanent/temporary) Occupation Work history Work conditions, hours Family-friendly practices/flexibility Parents’ income Earnings (gross/net/personal/household) Income support (amounts and types) Total income bracket Financial stress Parents’ (other) human capital Education Ethnic background Country of birth Ethnic identity Language (including English proficiency) Religious identity
	Child functioning
	Behavioural (externalising, hyperactivity, etc) Emotional (internalising, anxiety, etc) Temperament Self regulation, empathy Motor/physical development Social competence
	Characteristics of home
Location (region/physical environment) Type/condition of dwelling Overcrowding Cleanliness/orderliness	

Continued

Core measures	Community
	<ul style="list-style-type: none"> Availability and use of parks, other amenities Involvement in local groups Perception of community safety Neighbourhood (trust, knowledge and involvement) Services <ul style="list-style-type: none"> Access/use/satisfaction with services (libraries, maternal and child health clinics, hospitals, family/community centres, pre-schools, child care, legal, counselling etc)
Family functioning	Other
	Consent for biological measures, data linkage
	Parenting cognitions and practices (intact & separated parents)
	<ul style="list-style-type: none"> Beliefs and goals Discipline practices Consistency, monitoring Involvement of self and other parent in various domains Agreement/conflict between parents about parenting Parenting self-efficacy Parenting stress/coping Attitudes and expectations about: <ul style="list-style-type: none"> Education Work Cultural issues Gender roles Parental role stress Work and family balance Stressful life events Parenting education
Educational	Relationships
	<ul style="list-style-type: none"> Parents' marital relationship / co-parental relationship Family cohesion Sibling relationships Parent-child relationship Child's friends/ peer groups
	Social supports
Child 4 years	<ul style="list-style-type: none"> Wider family Other social support
	<ul style="list-style-type: none"> Language and cognitive development Readiness to learn Pre-literacy activities Participation in preschool/kinder programs Use of libraries / books, at-home reading Children's out-of-home activities Parent attitudes and expectations about education Language stimulation Carer/teacher – child relationship Family-centre relationship, involvement Teacher characteristics Characteristics of school/preschool <ul style="list-style-type: none"> Child-staff ratio Group sizes Ethos, climate

Continued

Health	Overall health
	Illness, disability (type/duration) Immunisation Biological measures Height Weight Diet Motor/physical development, coordination
	Child 0 years
	Gestation and birth Birth weight Birth length Feeding (breast/bottle) Full-term/premature
	Child 4 years
	Gestation and birth cognitive measures Biological measure: girth Obesity: diet, physical activity/sport/TV/computer
	Parental health
Overall health Illness, disability (type/duration) Maternal stress (in pregnancy, post-natal) Substance use Lifestyle (healthy)	
Child care	Child care / Preschool/kindergarten
	Availability/access issues Current use – time, hours etc Current cost, affordability Age at entry Current type (includes multiple) Changes/adjustment to transition Characteristics of centre and program Child-staff ratio Group sizes Quality indicators (eg accreditation)
	Parents
	Satisfaction with care Preferences Reasons for use
	Relationships
	Carer/teacher–child relationship Family–centre relationship, involvement
Source: Longitudinal Study of Australian Children, Australian Institute of Family Studies, 2002.	



4 Comments and conclusion

In this discussion paper we have presented an overview of the Longitudinal Study of Australian Children with a focus on the research questions to be addressed. As noted, final decisions on some aspects of the study design are to be made during Stage One of the study development phase which is currently underway.

Where to from here?

Readers with an interest in the study are invited to subscribe to the LSAC Reference Group, which is an email discussion list hosted by the Australian Institute of Family Studies. Membership includes academics, service providers, government officials, and other stakeholders within and outside Australia. Subscribers will be kept up to date with developments in the project. Ideas and other contributions from Reference Group members will be gratefully received, including comments on this discussion paper.

For details about how to subscribe to the LSAC Reference Group please go to the LSAC web page (<http://www.aifs.org.au/lzac/>). New information about the study will be posted on the web page as it comes to hand.

Access and analysis of LSAC data sets

Data collection for LSAC will commence in 2003, and it is currently expected that data from the first wave will be released in late 2004. As stated earlier in this paper, it is intended that LSAC data will be widely available for research purposes.

The data sets will be designed to be as user-friendly as possible, and in particular to facilitate analyses which exploit the longitudinal nature of the data. Hierarchical data sets will permit analysis of children and their families in their community contexts. The LSAC Consortium will do such analysis as is necessary to ensure the reliability of the data and to guide further waves of data collection, and the Department of Family and Community Services will contract out further analyses as required. Policy and procedures will be developed to govern access to the data.

Confidentialised data will be warehoused at the Australian Institute of Family Studies. Identifiers such as detailed location and occupation data will be suppressed to ensure the protection of participants' identities. It is expected that documentation of all derived variables, coding frames and weighting procedures will be provided along with the code book and questionnaires.

It is expected that there will be three major forms of documentation:

- technical documentation of the database content and structure;
- a user handbook; and
- a series of dedicated technical papers providing detailed documentation on specific topics.

User support will be offered, for example, through:

- producing and circulating a regular newsletter;
- providing training courses;
- holding user seminars at different locations around the country;
- providing easily accessible documentation from a dedicated web site;
- providing a user support service accessed via a free-call telephone number or email; and
- establishing and maintaining a users group network communicating via an email-based list server.

Final comments

This study represents an opportunity to extend on previous Australian longitudinal studies of young children, by providing the first ever prospective data on two large national representative samples of children, across a wide spectrum of their characteristics, experiences, contexts and outcomes.

It also represents a new “partnership” approach to research in this area. Leading researchers with a broad range of expertise in child development and coming from diverse disciplinary backgrounds will work together, and with government, to ensure that LSAC is scientifically well grounded, methodologically rigorous, and comprehensive in its treatment of policy-relevant questions. It will thus help to provide answers to a wide range of social policy and developmental research questions.

In sum, the Longitudinal Study of Australian Children will be a landmark study. The work to be undertaken represents a partnership between the Government and the academic and research community. It is a unique first opportunity to provide policy-makers with solid, comprehensive evidence on which to base future intervention and prevention policies for families and children, and it will be a valuable national data source for researchers.

We hope LSAC will play a significant role in ensuring that future Australian children have the best possible start in life.

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