Growing Up in Ireland
National Longitudinal Study of Children

LITERATURE REVIEW SERIES

NUMBER 3

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INFANT COHORT

Review of the Literature Pertaining to the First Wave of Data Collection with the Infant Cohort at 9 Months

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REVIEW OF THE LITERATURE PERTAINING TO THE FIRST WAVE OF DATA COLLECTION WITH THE INFANT COHORT AT 9 MONTHS

Sheila Greene, James Williams, Erika Doyle, Elaine Harris, Cathal McCrory, Aisling Murray, Lorraine Swords, Maeve Thornton, Amanda Quail and Richard Layte, Tom O'Dowd, Christopher T. Whelan

Name	Title	Institution
Sheila Greene	AIB Professor of Childhood Research; Director of Children's Research Centre and Co-Director, Growing Up in Ireland	TCD
James Williams	Research Professor and Principal Investigator, Growing Up in Ireland	ESRI
Erika Doyle	Research Fellow (Children's Research Centre)	TCD
Elaine Harris	(formerly) Research Fellow (Children's Research Centre)	TCD
Cathal McCrory	Research Fellow	ESRI
Aisling Murray	Research Fellow	ESRI
Lorraine Swords	Research Fellow (Children's Research Centre)	TCD
Maeve Thornton	Research Fellow	ESRI
Amanda Quail	Research Fellow	ESRI
Richard Layte	Research Professor	ESRI
Tom O'Dowd	Professor of General Practice (School of Medicine)	TCD
Christopher T. Whelan	(formerly ESRI) Chair, School of Sociology	UCD

ESRI

Trinity College Dublin

Office of the Minister for Children and Youth Affairs
Oifig an Aire Leanaí agus Gnóthaí Óige

Office of the Minister for Children and Youth Affairs
Department of Health and Children
Hawkins House
Hawkins Street
Dublin 2
Tel: +353 (0)1 635 4000
Fax: +353 (0)1 674 3223
E-mail: omc@health.gov.ie
Web: www.omc.gov.ie

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About this Review

The first chapter introduces ***Growing Up in Ireland (GUI)***, the national longitudinal study of children in Ireland***,*** and describes the approach adopted in the study, including the conceptual framework that guides the data collection. It outlines the objectives of the study and some of the issues it is designed to address. The ***GUI*** study follows the development of two cohorts of children, a Child Cohort (starting at nine years) and an Infant Cohort (starting at nine months). This literature review focuses on nine-month-old infants.

The next chapter summarises some of what we know about children at nine months of age, drawing on data from other similar nations but also highlighting what we currently know about infants in Ireland and the context in which they are growing up.

In the following chapters some of the research questions that can be addressed by the survey of nine-month-old infants, their parents and carers will be outlined. The following are the key outcome domains for the nine-month-olds in ***Growing Up in Ireland***:

- Physical health and development
- Social, emotional and behavioural wellbeing
- Cognitive development

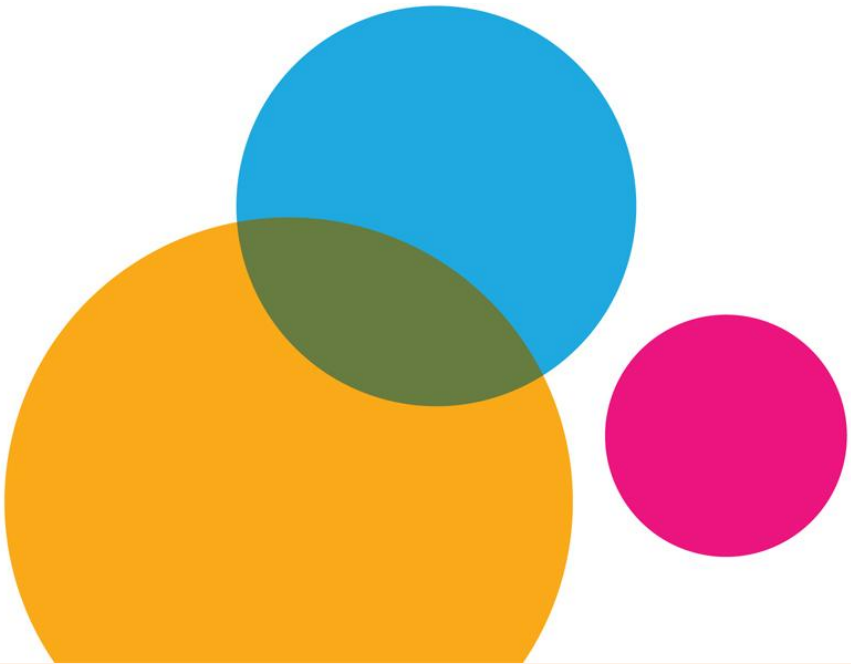
The next two chapters review the current literature on child development in infancy under the main categories of child outcome listed above. Within each chapter, the discussion is organised according to the major research questions considered by the Study Team to be of particular significance. These research questions are illustrative of some of the many questions that can be examined using the data to be collected by ***Growing Up in Ireland***.

The final chapter starts with a discussion about the importance of infancy as a period in human development and what we know about the connections between infant development and experience and later outcomes. It ends by highlighting some of the current policy issues pertaining to infants in Ireland and their families. The results of ***Growing Up in Ireland*** will inform child policy formation.

This document is one of a series of related publications. Extended coverage of the background and conceptual framework of ***GUI*** can be found in ***Growing Up in Ireland – Background and Conceptual Framework***. There are also separate reviews of the literature relevant to the nine-year cohort (Greene *et al*, 2008) and on qualitative research with children (Greene & Harris, 2009), reports on the design of the surveys and the instrumentation employed in the project (Williams *et al*, 2008a; Williams *et al*, 2009b) and a series of brief reports entitled ‘Key Findings’ (Growing Up in Ireland Study Team, 2009).

Chapter 1

INTRODUCTION



CHAPTER 1: INTRODUCTION

1.1. Background and Objectives

The principal objective of ***Growing Up in Ireland***, the national longitudinal study of children, is to describe the lives of Irish children, and to establish what is typical and normal as well as what is atypical and problematic. The study will focus on a broad range of child outcomes with a view to documenting how well children in Ireland are developing along a number of internationally recognised dimensions. In so doing, it will facilitate comparison with findings from similar international studies of children, as well as establishing norms within Ireland. Being longitudinal in nature, the study will also describe developmental trajectories over time and will explore the factors which most affect those trajectories and the life chances of children as they develop. The Infant Cohort will be followed into early childhood (age 3) and the nine-year-olds into adolescence (age 13). The value of this longitudinal study could be strengthened immeasurably by continuing data collection beyond two waves. The study as currently designed will provide a valuable evidence-base of research and insights into children and childhood, which will inform and contribute to the development of responsive policies and the design of better services for children and their families.

The first phase of the project will extend over seven years and will involve two longitudinal sweeps of data collection from a nationally representative sample of children in both cohorts. ***Growing Up in Ireland*** will focus, therefore, on two cohorts of children, a nine-month cohort of approximately 11,000 infants and a nine-year cohort of approximately 8,500 children. The nine-month cohort, which is the focus of this review, will be selected through the Child Benefit Register. A random sample of names will be selected and the parents/guardians of eligible children will be invited to participate in the study. The parents will be interviewed in the home, and input will also be sought from the infant's regular carer and non-resident parent, where relevant. The interview in the home will last for approximately 90 minutes.

Growing Up in Ireland can be set within the National Children's Strategy (2000). The primary objective of the strategy is to "….enhance the status and further improve the quality of life of Ireland's children" (p.4). It affirms Ireland's commitment to respect children as fully participating members of society in their own right. The three main goals of the National Children's Strategy are: to give children an appropriate voice in matters which affect them; to improve children's lives through improved understanding; and to promote child development through the provision of supports and services.

The principles espoused by the National Children's Strategy are an integral part of ***Growing Up in Ireland*** and very much ensure that in its conception and planning it is a study *of* children, *with* children and *for* children. The study encompasses all children in Ireland – in all their multifaceted variation and diversity.

Growing Up in Ireland has *nine* stated objectives, as follows:

1. To describe the lives of children in Ireland, to establish what is typical and normal as well as what is atypical and problematic

2. To chart the development of children over time, to examine the progress and wellbeing of children at critical periods from birth to adulthood

3. To identify the key factors that, independently of others, most help or hinder children's development

4. To establish the effects of early childhood experiences on later life

5. To map dimensions of variation in children's lives

6. To identify the persistent adverse effects that lead to social disadvantage and exclusion, educational difficulties, ill health and deprivation

7. To obtain children's views and opinions on their lives

8. To provide a bank of data on the whole child

9. To provide evidence for the creation of effective and responsive policies and services for children and families

For the first wave of the Infant Cohort, the parents/guardians will be the principal participants. From the second wave on (and from the first wave of the older cohort), ***Growing Up in Ireland*** will allow children's views to be elicited through questions amenable to quantitative analysis but also, importantly, through a selection of open-ended questions that give expression to children's voices and allow children to give their views and record details of their own experiences. To capture the richness of children's experience of their worlds, the study incorporates a qualitative component with a particular focus on the use of methods that can elicit children's experience, perspectives and voice. A group of 120 families from the main quantitative cohort will also take part in the qualitative component. This combination will allow us to identify in quantitative and qualitative terms the child's perspective on their daily experience, and see how this changes as the child grows up. In relation to the nine-month-olds, it will obviously not be possible to elicit qualitative information from babies, so the primary focus will be on their parents, and on their observations, thoughts and feelings about their child and their parenting role. A developmental assessment will be conducted on the 120 babies in the qualitative study, complementing the data on developmental milestones collected in the main, quantitative study.

1.2 Why a longitudinal study?

Growing Up in Ireland is the most important and substantial research initiative ever undertaken with children in Ireland. Nothing of its nature, scale or complexity has been previously attempted in this State. The concept of ***Growing Up in Ireland*** follows a relatively long-established tradition set by a wide range of longitudinal studies of child development which have been or are currently being conducted by minority world countries around the world. For example, similar studies are running in the UK, Australia, Canada and the USA – some of them for a long time. The UK's Perinatal Mortality Survey, for example, has been running since 1946.

Growing Up in Ireland is, by definition, longitudinal in nature. For the Infant Cohort, this longitudinal design involves interviewing a nationally representative sample of the parents/guardians of nine-month-olds in the first wave of data collection and subsequently returning to the same set of children and their families for a second interview at three years of age.

The longitudinal approach greatly enhances the analytical potential of the project. It has at least two main advantages over cross-sectional approaches. First, it allows the examination of change at the micro-level of the Study Child and his/her family and to consider the impact of changes which are specific to the individual child and family on developmental and other outcomes. The measurement and analysis of dynamic relationships over time can be achieved only by use of good-quality longitudinal data. Secondly, the longitudinal design allows the control in analysis for unobserved characteristics of the child and his/her family and environments which do not change over time.

1.3 The place of early infant development in the life course

1.3.1 The importance of events and experiences occurring in infancy

Infant experience has traditionally been seen as exerting a powerful influence on the course of later development. In its strongest form, this perspective positions infancy as the most important and most formative period in child development. This standpoint has been called the *constancy* hypothesis or the *infant determinism* hypothesis (Clarke & Clarke, 1976; Kagan, 1998). The infant determinism viewpoint has a long history, finding powerful expression in the work of Freud and Bowlby.

Researchers such as the two Clarkes and Kagan would, however, argue that the view that events in infancy shape the course of later development is unsubstantiated. Kagan points out that infant memory is not very efficient and that memory of most events fades very quickly (1998). Assumed connections between experiences in infancy and later outcomes in development are due, he argues, in large part to ongoing continuities in the child's environment. On the other hand, some contemporary researchers are convinced that events in infancy, and not only severe adverse events, can have lasting effects on brain development and psychological functioning. They include writers such as Gerhardt, who wrote the popular book *Why love matters: How affection shapes the baby's brain* (2004). Gerhardt uses animal studies to bolster her view that lack of nurturing in the early years causes irreversible damage to the brain.

Fatalism about the inevitably negative outcomes of adversity in infancy is challenged by the many examples of recovery and resilience. Where abrupt changes in the child's context occur, dramatic changes ensue in how infants and older children respond, either for good or for ill. Thus young children removed from orphanages can show remarkable gains in their development (Rutter & the English and Romanian Study Team, 1998; Greene *et al*, 2008) while children whose family situation worsens through parental mental illness or parental separation can show deterioration in their functioning despite good beginnings. It may be that very extreme adversity, such as malnutrition or abuse, can have lasting negative effects on children's brain development or emotional systems. There are some clear examples of the carry-forward of the effects of negative experiences in infancy. Children reared from early infancy in poor-quality institutions (Rutter *et al*, 1998) provide a good example of the potential for lasting damage as well as the potential for recovery and resilience. Rutter's English and Romanian Adoptees (ERA) study showed that a significant minority of the children who had spent their first two years or more in Romanian orphanages had lasting cognitive and behavioural deficits. It is difficult, given the lack of documentation on such children, to know whether their problems are due to events before birth or their experiences in the orphanage. It is also unclear what precise mechanisms cause the long-term damage – i.e., whether it is poor nutrition, lack of stimulation or stimulation of the wrong kind – and why, when exposed to apparently similar situations, some children recover and others do not.

Contemporary developmental neuroscience has a strong focus on infant development, and may provide information in due course on how experience in infancy marks the brain and the psyche.

1.3.2 Prenatal development and later outcomes

It is important to distinguish between the effects of processes and events occurring before birth and those that occur after birth. As research reviewed in Chapter Three suggests, much work has been done on the long-term consequences of poor maternal nutrition and maternal ingestion of toxic substances. There is longstanding interest in the possible influence of the mother's psychological state on the development of the foetus, and this has been reactivated recently with a recent focus on the possible links between maternal elevated cortisol levels (caused by anxiety) and foetal development.

There is a lot of interest currently in deferred effects of prenatal adversity, effects that are not evident at birth but which emerge later, even decades later. Cohort studies are ideally suited to examining such long-term causal connections. The Barker Hypothesis states that reduced foetal growth is strongly associated with a number of chronic illnesses and conditions in later life (Barker, 1992). Barker argues that foetal growth retardation can be an adaptive response to maternal malnutrition, by which the foetus is prepared for life in a sub-optimal environment. However, the metabolic changes associated with this adaptation set the stage for ill health much later in life. The Barker Hypothesis is not without its critics, but some strong associations, for example, between low birth weight and cardio-vascular illness and diabetes in late middle-age have been found (Barker, 1992). In relation to the mechanism explaining this connection, more recent research concentrates on the possible contribution of epigenetic processes, proposing that poor maternal nutrition has produced epigenetic changes damaging the expression of the genes regulating sugar absorption. Evidence for this proposition has been found in studies with mice (Waterland & Jirtle, 2003).

The concept of epigenetics, in this case referring to biochemical influences on gene expression, has been used recently in a range of contexts. A number of animal studies have shown alterations in DNA methylation and other epigenetic changes which can alter gene expression. Such environmentally induced epigenetic changes can switch genes on and off or in other ways affect their functioning. Researchers in human development see epigenetics as an important avenue for understanding gene-environment interaction both pre- and postnatally. For example, Tremblay (2008) argues that his work and that of colleagues, showing the very early origins of chronic physical aggression, points to early environmental influences associated with maternal disadvantage and dysfunctionality, which may take effect at the epigenetic level. Preliminary comparisons of boys with and without high levels of physical aggression found that the aggressive boys had more methylated alleles in certain critical areas. On the basis of more clear-cut research on rats, Tremblay hypothesises that "stress and substance use during pregnancy might have a negative impact on offspring cognitive and behavioural development as well as on the immune system" (2008, p. 2618). At this point in time, there is no plan to collect genetic material as part of ***Growing Up in Ireland*** but it will be possible to examine the effect of some aspects of the infants' pre-natal experience (such as maternal stress and ingestion of alcohol and nicotine) on later development.

1.3.3 Development in early infancy and later outcomes

Brain development is more rapid during infancy than at any other period. The brain is at 30% of its adult weight at birth and 70% at age two (Thatcher *et al*, 1996). The significance of brain development at this stage is still not entirely clear, but some contemporary theorists have reactivated a modern, brain-science-led version of the infant determinism hypothesis (Kagan, 1998). Those who promote an infant determinism perspective argue that the rapid synaptic growth of the brain implies a sensitivity to environmental input, which both provides the opportunity for considerable learning and ensures a vulnerability to adverse experiences. Such experiences, for good or ill, are seen to be built into the wiring of the brain and are therefore potentially permanent. On the other hand, researchers such as Kagan (1998) and Bruer (1999) argue that there is no strong evidence of critical periods in infant brain development and that the growth of synaptic connections and myelination is ongoing throughout childhood and is not specific to early infancy. Also, synaptic pruning, which occurs later in childhood, is critically important for effective and more efficient functioning.

The need for sensitive and responsive nurturing in infancy was strongly asserted by Bowlby and others as they developed their work on infant attachment. Again, there is some dispute about the extent to which attachments formed in infancy show constancy throughout later development (Thompson, 2006). A number of longitudinal studies have shown that, depending on life circumstances, secure attachments can become insecure and insecure ones can become secure (Belsky & Feraron, 2002). However, the reality for most children is that their family situations and therefore their close relationships show considerable continuity over time.

Notwithstanding the argument about the extent to which experiences in infancy are hard-wired in the brain and in the mind and are carried forward into later life, there is no disagreement about the fact that experiences in infancy matter. Rutter (1989) uses the concept of chain effects to illustrate the notion that experiences are linked to each other and that good experiences tend to follow good experiences and bad follow bad. In this way, it is important that the first steps are healthy and secure since they will provide a strong foundation for the next stages of development. It is also important that the immediate quality of life of the infant is cherished and respected rather than seen merely as an investment in future positive development.

There has been lively debate in recent years about the importance of early prevention with regard to problems such as poor mental health and school failure. It has been pointed out that it is possible to identify many of the children who will have problems in their infant and pre-school years and that, if intervention is to occur, it makes sense to intervene early. One of the strongest voices associated with the argument for early intervention has been the economist Heckman, who argues that early prevention is not only more effective but also saves money (Heckman, 2004). The evidence base comes from the long-term follow-up of disadvantaged children exposed to early interventions and calculations about how

much state money is saved when children exposed to interventions are deflected from early school-leaving, poor work careers and criminal activity, the fate of the untreated comparison groups. At its most extreme the argument is made that, if interventions do not occur in the first few years of life, they will be too late. This argument is sometimes linked to statements about critical periods for brain and emotional development. Evidence indicates that, despite the value of early intervention, it is not enough. Children cannot be inoculated with good experiences in early childhood and then be expected to cope with whatever life throws at them. When children grow up in adverse environments, support is needed at all stages of their childhood. The same applies to children in supportive environments. Good beginnings need to be reinforced. As Heckman states, in a paper in which he revises his previous total emphasis on the early years, "We need to invest early in children and not stop" (Heckman, 2007).

In Ireland, services for infants have focused mainly on their physical health. There are, for example, virtually no infant mental health programmes (Maguire & Metacz, 2007). The provision of parenting and family support programmes is patchy and little attention is paid in secondary schools to the preparation of young people for parenthood. There are some innovative new programmes focusing on the parenting of infants and pre-school children (see Prevention and Early Intervention Programme, www.dcya.ie). Some programmes replicate well-established parenting programmes (e.g. The Incredible Years) and some represent new approaches, the success of which remains to be determined. Parents of infants often have to return to work early, with considerable concern about accessing affordable, high-quality child care. There are a number of issues that have policy implications; some of these are spelled out in the final chapter of this review.

Longitudinal studies worldwide are making a valuable contribution to our understanding of infancy and how experiences in infancy influence the course of later development. Comparable studies to ***Growing Up in Ireland***, such as the Millennium Cohort Study (MCS), Growing Up in Scotland and the Longitudinal Study of Australian Children (Growing Up in Australia), started earlier and have published interesting findings on their infant participants and their families. These studies are beginning to make connections between infant data and later data waves. For example, the MCS found that children who were looked after by grandparents at nine months while their parents worked had a similar vocabulary score at age three to children who had been in centre-based care (Hawkes & Joshi, 2007) and that children with developmental delays at nine months had more behavioural problems at age three (George *et al*, 2007).

Older longitudinal studies such as the Canadian National Longitudinal Survey of Children and Youth (1994) and the (American) NICHD Study of Early Child Care and Youth Development have tracked their participants into late childhood. The NICHD study has, for example, delineated the important features of quality in child care and how they are related to child outcomes.

Growing Up in Ireland will permit the examination and analysis of the impact of the infant's individual context on his or her functioning at this particularly important developmental phase. It will be able to cast light on the link between development at nine months and outcomes at age three. The infant data thus provide an important starting point from which to assess the factors influencing future development, trajectories and outcomes as the cohort ages.

1.4 Outcomes, risk and protective factors, and resilience

A longitudinal approach is also the preferred way of examining the impact of risk and protective factors on child outcomes, and particularly how one might offset the other. It also permits the examination of the effect on child outcomes when more than one risk factor is present. ***Growing Up in Ireland*** focuses on three main dimensions for assessing child outcomes: physical health and development; social, emotional and behavioural wellbeing; and educational achievement and intellectual capacity. Clearly, in relation to the Infant Cohort, formal education will not be an issue, but the children's early experiences both at home and in childcare settings will set the foundation for later educational outcomes. With this age-generated restriction in mind, the focus in wave one of the Infant Cohort will be on cognitive development rather than educational achievement and intellectual capacity.

A risk factor is a variable that increases the likelihood that a child will have a poor outcome in one or more of these dimensions. Often it is the co-occurrence or interaction of risk factors that is particularly powerful and of interest to developmental researchers. Cumulative risk is therefore seen by most researchers as particularly important and most likely to lead to poor outcomes (Layte & Whelan, 2002). For example, Rutter (1979) argues that psychiatric problems are most likely where a child is exposed to a number of risk factors, not just one.

The potential effect of a given risk factor may be offset by the presence of a protective factor; sometimes this may be the opposite end of a risk continuum (e.g. poverty vs. wealth) but in other cases the opposite end of the continuum to a well-established risk factor is not protective. For example, maternal age is widely seen as a risk factor when very low but does not seem to be protective if very high. Also, a protective factor may become significant only if a risk factor is present (e.g. the risk of early abandonment being offset by adoption by a loving family).

A principal aim of a study such as ***Growing Up in Ireland*** is to identify protective factors in the development of this cohort of children in Ireland, which may feed into policies that introduce protective factors where they might otherwise have been missing or that bolster existing protective factors. The study will also be able to identify protective factors operating selectively in the lives of some children, but not in others.

In recent years, researchers have become interested in the concept of *resilience*: typically defined as normal, or near-normal development, in spite of adversity (Garmezy, 1983). Early studies emphasised resilience as a property of the child but more recent work adopts a more systemic perspective, recognising that resilience results from both child and contextual processes (Luthar, 2006). In line with the dynamic systems perspective, which dominates current thinking in developmental science and provides the conceptual framework for the ***GUI*** study, resilience can usefully be conceptualised as the outcome of the ongoing bidirectional person-context system (Lerner, 2006). In the ***GUI*** study it will be possible to identify children who are doing well despite difficult circumstances that are associated – either in the research literature or in ***Growing Up in Ireland*** – in aggregate, with poor outcomes. Longitudinal studies have been crucial in showing that, even with extreme conditions of environmental adversity, there can be a substantial degree of recovery (Rutter, 1994). As Rutter (2006) points out, "Resilience starts with a recognition of the huge individual variation in people's responses to the same experiences and considers outcomes with the assumption that understanding that variation will cast light on the causal processes" (p.3). Examining resilience entails a focus on individual variation in the response to risky conditions and to adversity.

The analysis of risk and protective factors and resilience processes in ***Growing Up in Ireland*** will have direct implications for preventive and therapeutic intervention strategies. It is important for Ireland that such interventions be based on an understanding of how risk operates in an Irish context, since risk research conducted elsewhere may have limited relevance. Contemporary researchers agree that risk must be seen as context-specific (Luthar & Zelazo, 2003). In recent years there has been an increased focus on the importance of early intervention in the lives of children perceived to be at risk of poor outcomes. It is hoped that ***Growing Up in Ireland*** will be able to contribute to the international debate on the complex operation of risk and protective factors and processes in children's lives and in the shaping of child outcomes.

1.5. Timeliness of Growing Up in Ireland

It is particularly appropriate that ***Growing Up in Ireland*** in its present form and scale should have been initiated at this time. Since the early 1990s unprecedented change in Ireland's economy, socio-demography, culture, society, value systems, etc has taken place (Whelan & Layte, 2006). In the late 1990's and early 2000's Ireland experienced high economic growth and became increasingly multicultural. It went from a position of high unemployment in the early 1990s to almost full employment by the mid 2000s. This was accompanied by increased female labour-market participation and labour shortages in some sectors of the economy. In some parts of the country, commuting times to and from work have increased substantially – often causing pressures and tensions in terms of work-life balance,

and time available for family and children. Significant changes in family structures have occurred, with a substantial increase in non-marital births and lone parenting. Approximately 31% of births in Ireland today are outside marriage (Bonham, 2005). These trends in society, labour market and fertility are reflected in a situation in which approximately 22% of families with primary school children use some form of non-parental childcare arrangements (Central Statistics Office, 2006).

However, since the latter half of 2008 there are indications that this economic growth has slowed dramatically, with a number of, as yet, unpredictable consequences. Already it is clear that levels of unemployment are rising and house prices are falling (Barrett, Kearney & O'Brien, 2008). Some of the recent social changes influencing children's lives, such as later marriage and smaller families, are likely to persist, but a severe economic downturn could bring about a new range of untoward effects on children's development and wellbeing.

All of the changes noted since the early 1990s have had an impact on the structure of society and have replaced previous traditional certainties with new, often unaccustomed structures and processes whose impact on children and childhood can only be guessed at in the absence of relevant research. ***Growing Up in Ireland*** will provide important new and comprehensive information on the current position of children in Ireland and on how it changes over time.

1.6 Conceptual framework

1.6.1 Introduction[1]

A broad spectrum of cross-disciplinary research has identified a range of influences on children's developmental outcomes. These include individual and family characteristics and the economic, social and physical environments in which children are raised. Deriving an understanding of how this multitude of factors is interconnected and how they contribute to wellbeing requires an integrated conceptual framework that is informed by the insights of a variety of disciplines. There are, in fact, remarkable parallels in conceptual development across a range of disciplines that allow a holistic conceptual framework to be developed within which the factors influencing children's development can be understood. The first of these 'parallel insights' is the understanding that individual outcomes can only be understood within a larger '*ecological'* context. From this perspective, a child's growth and development is intimately tied up with both the proximate and distal context in which they live. Immediate family and friends are seen to be important, but so too are the child's local community and the wider socio-cultural environment.

The second insight could be referred to as *dynamic connectedness*, whereby processes in the different layers of this ecological context may well lead to changes in all other levels. Layers are interconnected such that the developmental path that any one individual will take is determined by the interaction of factors at a number of levels. This perspective also assumes that the individual is an active agent influencing their own outcomes through their interaction with their environment.

The third insight is that of *probabilism* (Lerner, Dowling & Chaudhuri, 2005): that, because of the evolving reciprocal nature of systems of change, relations among variables may change over time and, to a certain extent, cannot be repeated. The implication of this perspective is that we should not look for static, universal laws, but instead attempt to understand the 'trajectory' or 'developmental pathway' along which the person has travelled. This perspective also suggests that causation is multi-factorial and, although cross-sectional research using correlations between predictors often points to 'vicious circle' processes where poor outcomes are predetermined, longitudinal research shows that multiple and cumulative disadvantage are a good deal less common than some research suggests (Layte & Whelan, 2002). Problems or dysfunctionality are only some of the possible outcomes from a wide range of outcomes in any interaction between individual characteristics and the environment in which they develop (Lerner, 2006). The implication of this perspective is that relationships between variables can only be understood probabilistically and that understanding possible developmental pathways and crucial

[1] For a full description of the conceptual framework for ***Growing Up in Ireland***, please ***Growing Up in Ireland – Background and Conceptual Framework***

points of transition is more important than understanding the correlation between dependent and independent variables.

The fourth insight is derived from the third and is related to the *period* of events. The developmental pathways along which people travel occur in a specific historical time and this leads to differential outcomes and specific 'period' effects. This means that almost identical processes occurring in different historical time periods can have very different outcomes.

The fifth insight is the role of *agency* and, in particular, the active role of the child in the developmental process. Across a number of disciplines there has been a move towards seeing individual agency and predisposition as important and this has been marked in research on the active role of the child, even in early infancy, in shaping outcomes. The infant is an active player in the moulding and development of his or her environment. For example, a baby with an easy, genial temperament will attract more support from adults than an infant who is cranky and difficult (Calkins, 2002). The infant is not a passive recipient of influences, but is an active and interactive contributor to all the people and environments that he or she encounters.

These five insights can be found across a range of disciplines, from developmental psychology, educational development, sociology, public health and epidemiology; they form the conceptual backbone of what has come to be known as *developmental science* (Lerner *et al*, 2005). They underlie the conceptual framework for ***Growing Up in Ireland*** and clearly circumscribe its development and design. They are discussed more fully in ***Growing Up in Ireland – Background and Conceptual Framework***

1.6.2 The importance of ecological context

Up to the mid-1970s, developmental psychology focused on the individual and the tight circle of family around him or her, with little regard to the wider world. About this time, however, psychologists started to consider ideas from other disciplines such as sociology and demography, and broadened their perspective. The paradigm shift in developmental psychology, which occurred in the late 1970s, can be traced to a number of researchers, but its most effective formulation has been in the work of Urie Bronfenbrenner (Bronfenbrenner, 1979; 1993). This work offered a re-conceptualization of the child's ecology as a multilayered set of nested and interconnecting environmental systems, all of which influence the developing child, but with varying degrees of directness (Greene, 1994). The perspective has evolved since its early inception and today acknowledges the role of biology in the overall development of the person; hence the model is now referred to as the *bioecological* model (Bronfenbrenner & Morris, 2006).

1.6.3 Overview of the bioecological model

There are four defining properties of the bioecological model: *Process*, *Person*, *Context* and *Time*. Human development is hypothesised to take place primarily through *proximal processes*: interactions between the developing person and his/her environment, including other people in that environment. These interactions become increasingly complex, and to be influential must occur on a reasonably regular basis over extended periods of time. The form, power, content and direction of the proximal processes are influenced by the characteristics of the individual person and the environment in which they are taking place.

The model identifies three characteristics of the *person* that impact on proximal processes: *Dispositions*, *Resources* and *Demands*. *Dispositions* or *Forces* influence what processes are put in motion and how they are sustained. *Resources* are the biopsychological characteristics that affect a person's ability to make the most of proximal processes. *Demands* are the characteristics of a person that can invite or discourage reactions from others that can in turn promote or disrupt development through process. Characteristics of *age*, *gender*, and *ethnicity* are highly influential, as these characteristics often determine an individual's status and role in a particular environment.

The property of *Context* acknowledges that the developing person is influenced by their interactions with objects and places as well as people; and that the environmental context can influence proximal processes.

The influence of *Time* has been accorded increasing weight as the bioecological model has evolved (Bronfenbrenner and Morris, 2006). *Time* affects development in a number of ways: it is important as an historical context for a person's development, and the timing of key events in a person's life can affect their impact. Adding *time* to the model serves to emphasise the dynamic nature of development. In terms of personal time, nothing remains static; life is lived between the past and the future.

Within the bioecological approach, the relationship between parent and child is part of a larger set of interactive systems that compose the ecology of human life (Bronfenbrenner, 1979; 2001). These systems are layered in terms of their influence on child development. In *Figure 1.1*, these systems or layers are represented as concentric circles, extending outwards from the individual child and his or her personal characteristics. Parents and family are the next most influential system in child development, and have the most direct contact with the child; hence they are represented in the circle or layer immediately surrounding the individual (the *microsystem*).

The parent and child dyad is enmeshed in other relationships within the household, but parents and children also have relationships outside the household, in a childcare setting or in school for example, and in the workplace, that fuse the household to the wider community. To Bronfenbrenner this illustrates the intimate relationship between the *microsystem*, the face-to-face interactions which the child experiences, and the *mesosystem*, which encompasses the links between the different actors in the microsystem, that is, the relationships between parents, between home and school, and between close family and extended kin. In the infant cohort, the most important people in the infant's world are the child's parent or parents and they are critically important sources of influence on the baby. Even though the infant will interact minimally with the wider ecology that surrounds him or her, many factors exert influence on the parents' behaviour and on their capacity to provide a supportive environment for their infant. Thus, whether the parent or parent is employed or fulfilled in their employment will indirectly impinge on the infant's quality of life, through the parents' income and resources and their psychological wellbeing. At the same time, each newborn baby brings his or her qualities, behaviours and demands to bear on the parents. To take something as simple as the sex of the baby, it is established that parents react very differently to their infants according to whether the infant is a boy or a girl (Stern & Karraker, 1989). Another example is whether or not the baby is premature or full-term; the typically more fragile premature babies place more demands on their parents (Barratt *et al*, 1996).

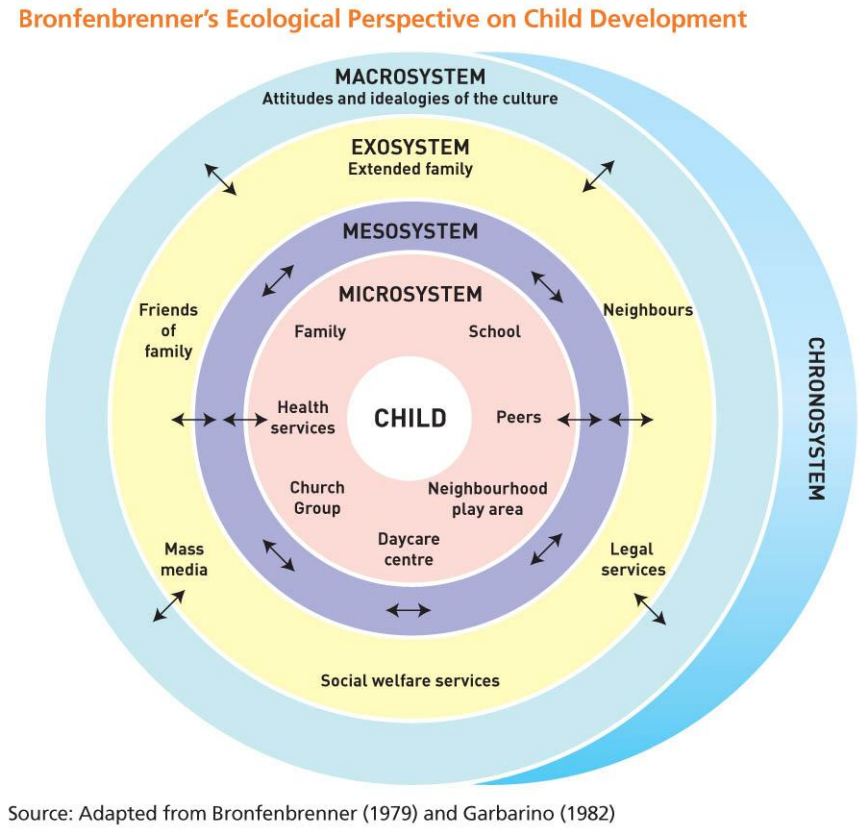


Figure 1.1: Bronfenbrenner's Ecological Perspective on Child Development

Outside the *mesosystem* in Bronfenbrenner's model sits the *exosystem*. In Bronfenbrenner's framework, this comprises the structures, institutions and settings which, while not in direct contact with the child, nonetheless exert an important influence on their quality of life and outcomes. Examples of determinants within the exosystem would be departments of state which, although not directly in contact with the child, will still have an important impact on their wellbeing through areas such as welfare services. The last ring of Bronfenbrenner's schema is the *macrosystem* which consists of the culture-specific ideologies, attitudes and beliefs that shape the society's structures and practices. The model draws attention to the way in which state institutions and state policies indirectly affect the quality of life and life chances of infants born in Ireland. Thus, whether or not the State provides adequate parental leave for all working parents or income supports for vulnerable families will influence the quality of the child-rearing environment for infants growing up in Ireland. Together these three levels provide a catalogue of factors that may influence the experiences and wellbeing of a child as he/she develops from birth to adulthood. The passing of time during this development, and time as a context for development, is represented as the three-dimensional aspect in *Figure 1.1*.

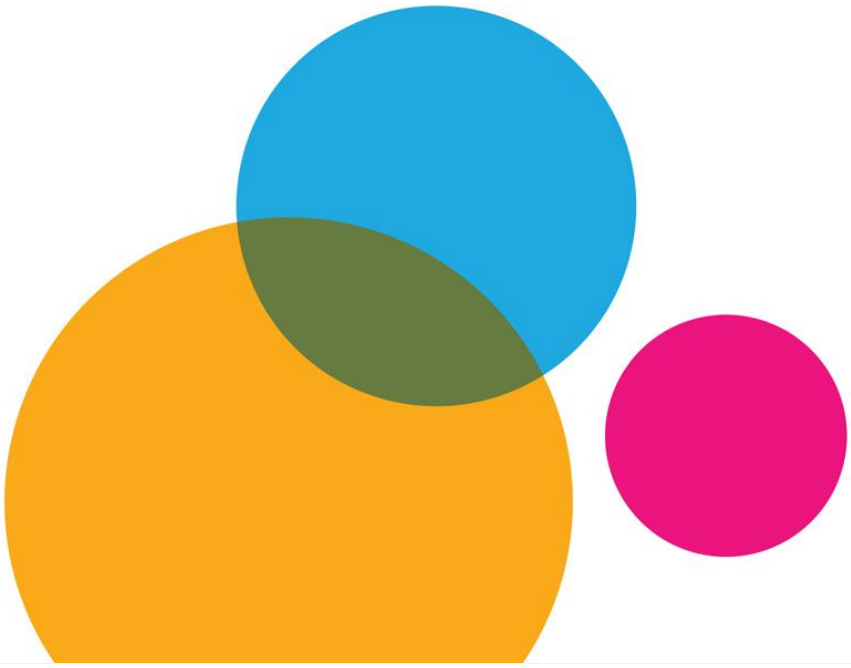
1.7 Summary

The ***Growing Up in Ireland*** Infant Cohort data will provide invaluable cross-sectional data on the lives of infants in Ireland and the contexts in which they are growing up. However, they also provide the foundation for a longitudinal study of the development of a large and representative study of children in Ireland. These longitudinal data can answer questions about what shapes the lives of children and can inform policies and practices that support children's optimal development. The data from ***Growing Up in Ireland*** can also be compared to the data collected by many other countries that recognise the value of birth and infant cohort studies.

The conceptual framework adopted by ***Growing Up in Ireland*** emphasises children's connectedness to the world within which they live. It also highlights the importance of considering the multifaceted nature of development over the life-course and the child's active role in shaping his or her environment from birth onwards. By taking account of the multiple, interacting and bidirectional influences on child outcomes, ***Growing Up in Ireland*** has adopted a comprehensive and powerful model of development that will increase the power of the data and the capacity of the ***GUI*** study to address issues that are important to those who wish to promote the healthy and happy development of infants in Ireland.

Chapter 2

BEING 9 MONTHS OLD



CHAPTER 2: BEING 9 MONTHS OLD

2.1 Introduction

Infancy typically defines the period of life between birth and the emergence of language when the child is approximately 1.5 to two years old. It encompasses only a small fraction of the average person's life span but it is the period when the child is most dependent and therefore most demanding of parental attention. It is also a period of rapid change so has an intrinsic fascination for parents and other observers. Parenting responsibilities are greatest during infancy, when the child is most dependent on care-giving and the child's ability to cope alone is almost non-existent. The parent of a baby who is nine months old has to attend to the infant's physical, cognitive, social and emotional needs and be able to support the infant's development.

Infant development involves parallel and rapid growth in biological, psychological and social spheres. By nine months, the healthy infant will have made impressive gains in competence in his or her motor, language, cognitive and social development. However, normal development may be nonlinear in nature, stalling sometimes, or even regressing temporarily (Harris, 1983).

2.2 Different rates of development

In reviewing the literature and in collecting data on a representative sample of nine-month-olds, it is important to bear in mind that infants do not all develop at the same rate. Much of this variability is entirely within the bounds of normality. Indeed, the data collected in ***Growing Up in Ireland*** will give a very good picture of the range of normality and the heterogeneity in the patterning of development in nine-month-olds in Ireland. It will also identify those children who are outside the norm statistically and those who may appear to be developing normally at nine months but who are faring less well at follow-up at age three. In the latter group there may be some clear or even subtle indications of later problems that could possibly be used as a focus of early intervention. A small percentage of the infants will have readily diagnosable medical conditions that compromise their development. In the wide range of such conditions, outcomes can be modified by the quality of support available to the infant and to the parents. Thus, for example, Down Syndrome in decades past would have been seen much more pessimistically than it is now, when infants born with Down Syndrome receive early support and when there is more medical and social understanding of the condition and how good outcomes can be achieved (Hoey & Murphy, 2001).

2.3 The typical nine-month-old infant

The following literature will often refer to 'the typical nine-month-old', indicating that this is broadly what might be expected in an infant who is not known to have a significant medical or cognitive deficit. In all uses of the term, or terms synonymous with it, 'typical' should be seen as encompassing a range of behaviours, competencies and attributes.

2.3.1 Physical development

Infancy is a time of rapid physical and nervous system development. It is also a time when rapid progress is made in the infant's capacity to move around his or her environment and engage with the objects and situations encountered.

Size and weight

On average, newborns measure 49-50 cm and weigh 3.4-3.5 kg. By nine months the infant will have grown by nearly half their birth length and their weight may have tripled by their first birthday (National Centre for Health Statistics, 2001). According to US statistics, the average nine-month-old boy weighs

9.2 kg and is 72 cm in height while the average nine-month-old girl weighs 8.4 kg and is 70 cm in height (http://www.cdc.gov/growthcharts).

Low birth-weight can lead to a number of negative health outcomes (Institute of Public Health, 2005) and can be caused by straightforward prematurity (born 35 weeks or less after conception) or being 'small for date' or small for gestational age, implying a failure to develop at the proper rate given the time *in utero*. The latter group are more at risk for poor outcomes, although prematurity also has persisting consequences. For example, by the age of nine months the effects of prematurity will still be evident in the delayed development of the infant, whose size and behaviours will typically be more in keeping with his or her gestational age than age calculated from date of birth (Kopp & Kaler, 1989). Many premature but normally developing babies will catch up, whereas the small-for-date baby may show longer-term signs of their problematic uterine development. Another important distinction is between low birth-weight and very low birth-weight infants (less than 1,500 grams), with the latter group, predictably, showing much poorer outcomes (Zelkowitz, 2006).

Brain development

From birth onwards the brain begins a phase of rapid development. Synaptic growth is more rapid in infancy than in any other subsequent period (Huttenlocher, 2000). The increased myelination of fibres and proliferation of glial cells lead to growth in the size of the brain, which weighs 30% of the adult brain at birth and 70% by age two. The brain does not develop at the same rate in all areas. Thus, for example, the infant's capacity to remember new experiences is limited by the immaturity of the area of the hippocampus that connects to the cortex. This area does not become adult-like until the child is around 12-15 months of age (Bauer & Pathman, 2008).

Brain development in infancy seems to be largely pre-programmed, requiring no special stimulation and environmental input beyond what is normal in human family life. This type of brain growth is referred to as 'experience-expectant brain growth'. Special skills such as riding a bicycle or reading music involve what is termed 'experience-dependent brain growth' but this does not typically apply to the developing infant who does not require specialised inputs to fare well. On the other hand, extreme deprivation of the expectable level of nutrition, stimulation and positive human contact can disrupt brain growth, as seen in children who spend their infancy in very poor-quality institutions (Rutter *et al*, 1998). Along with evidence of brain damage, there is also evidence of developmental resilience and therefore brain plasticity in this same population (Greene *et al*, 2008). It is not always clear why some babies recover while others show lasting effects of deprivation, both cognitively and behaviourally. High levels of brain plasticity have been found in infants who suffer from brain damage (Stiles, 2001). Developmental neuroscientists are only beginning to understand the processes that influence both the vulnerability and the plasticity of the infant brain.

2.3.2 Health

In the first two years of life the infant's energy needs are twice that of the adult. Adequate nutrition is critically important to maintain good physical development and health. Infants are therefore particularly at risk in countries suffering from famine or political turmoil that impedes access to food. Even in affluent countries, children's health may be compromised by inadequate nutrition (Grantham-McGregor *et al*, 2000). Such problems tend to be class-linked, with infants in poor and less-educated families being less well-nourished (Institute of Public Health in Ireland, 2005; Iwaniec, 2004). Children of parents (particularly mothers) who are negligent or abusive are also more likely to show delayed growth (Iwaniec, 2004); the precise mechanism for this form of failure to thrive is disputed.

Mortality in infancy varies markedly across the globe. Among the affluent countries in the EU, recent statistics indicate a range from 13.9 per 1,000 live births in Romania to 2.5 in Luxembourg (Eurostat, see www.epp.eurostat.ec.europa.eu). The Republic of Ireland had a rate of 3.7, in 2008, a marked decrease from 6.3 per 1,000 in 2000. In Ireland the main cause of death for infants under the age of one was 'certain conditions in the perinatal period', followed by 'congenital malformations', indicating that most

deaths occurred early in the first year of life (www.cso.ie). Such data also point to the fact that the health of the infant is strongly influenced by prenatal threats to good health, whether genetic or acquired.

Recent statistics on hospital admissions in Ireland indicate that 31,412 infants, under the age of one, were admitted to hospital in 2007 (HIPE, see www.esri.ie). For this age group, the most common cause of admission was 'certain conditions originating in the perinatal period' (29%), followed by diseases of the respiratory system (14.6%), followed by infectious and parasitic diseases (12.3%). The rate of externally caused injuries and poisoning was much lower (2.8%) than it was for all other age groups up to age 17, where it is typically above 10%.

The currently available statistics are not fine-grained, but we can assume that the majority of infants in an affluent society like Ireland are healthy, experiencing only minor coughs, colds and other transient conditions.

2.3.3 Motor development

Gross motor

Gross motor development refers to the infant's capacity to move around in their environment. There is a sequential nature to both gross and fine motor development. The average baby will develop from being able to hold his or her head erect at seven weeks to rolling and grasping objects at four months, to sitting alone at seven months and then to pulling himself or herself up to a standing position at eight months. During the first year of life the baby develops from the relatively immobile state of the early months to being able to walk or almost ready to walk at around one year old. Most babies crawl before they walk – typically around 8-9 months – although a minority will move around on their bottoms and a few will do neither. At nine months the typical child will be at the start of a bipedal journey; some will be pulling themselves up to stand and can stand when supported, while a small number will already be walking. They will continue to refine their gross motor skills so that they can walk with greater control and carry objects from place to place. The average nine-month-old can sit up steadily without support and walk alone when holding furniture (cruising). A minority will have taken their first steps. In a Finnish study of 9,000 infants, the mean age at which children walked supported was 9.12 months and the mean age at which the children stood unaided was 10.21 months (Ridgway *et al*, 2009).

Fine motor

The refinement of fine motor skills – the capacity to engage physically with objects in the environment through hand/eye coordination, reaching, grasping and manipulation – also progresses rapidly from birth to nine months. Reaching and grasping start off as generalised, vaguely targeted movements. By around nine months the whole hand (palmar) grasp gives way to the pincer grasp, using thumb and forefinger. This is an important development as it lays down the foundations for learning, allowing the baby to hold blocks, build a tower, and hold crayons. Infants can now feed themselves more efficiently, being able to pick up small items like peas and raisins.

2.3.4 Perceptual development

Perception refers to the detection, organisation and interpretation of information from the environment. It is a prerequisite to thinking and problem-solving. All the knowledge the infant acquires comes through the senses – sight, hearing, taste, touch, smell. At birth these senses are all in working order, albeit relatively immature.

Vision

In relation to vision, at birth infants can discriminate objects only vaguely since their focal length is restricted to about eight inches (20 cm) (Maurer *et al*, 1999). Development progresses rapidly, so that by the seventh month the baby's visual system functions in much the same way as that of the adult. Acuity

and contrast sensitivity will continue to improve over the next few years. The development of facial perception during the first few months of life assists the infant's ability to recognise and respond to the expressive behaviour of others and to discriminate between people.

Hearing

The auditory system of infants appears to be well developed at birth, but the infant has to learn to make sense of what they hear. Babies seem predisposed to respond to the sounds of language, but their understanding of these sounds has to develop in order for them to use the speech sounds of their own language. Around seven to nine months, babies begin to break up the stream of sound into distinct elements. By nine months they are able to distinguish phonemes (short, potentially meaningful speech sounds), and it has been shown that, in this respect, very young infants are more competent than adults (Werker & Desjardins, 1999).

Smell, taste and touch

At birth babies are very sensitive to smell and show innate preferences for sweet tastes. Odour and taste preferences are quickly modified by learning. Contrary to what was thought up to comparatively recently, newborns are sensitive to pain (Chamberlain, 1989) and this sensitivity remains an important feature of the infant's learning about the environment. The positive response to touch, strongly evident in the newborn, is also evident in the nine-month-old infant's need for comfort and human contact (Ainsworth *et al*, 1978).

Integration of auditory and visual information

From very early on, hearing and sighted babies seem able to make the link between hearing and seeing. From birth they turn their heads to search for a sound source (Slater, 2000). This understanding becomes more sophisticated as they get older. Babies have been shown to have an understanding of events that have combined visual and auditory aspects. A study by Spelke (1976) involved babies of four months of age who were shown a film of activities where sound and vision matched and a film where the sound of one event was shown with the picture from the other. The infants preferred to watch the film where the sound track matched the actions, rather than when the sound tracks were switched. This suggests that even at this young age babies link what they hear with what they see.

From the first months of life until the age of about seven, a child's perceptual skills become more refined and his/her reactions and ability to perceive detail improve. This parallels the development in the ability to take in, sort and remember information.

2.3.5 Cognitive development

Improvements in perception occur over time as a result of maturing of the perceptual system and as a result of experience. Perception has a profound effect on the efficiency of thinking, but to make use of the information perceived it must be retained and be accessible when needed. Very young babies can remember, although their retention period is short. However, by nine months of age infants show the capacity to remember events and objects they encountered four to five weeks earlier and they can imitate, and therefore remember, short behavioural sequences that they have just observed (Bauer, 2004; Bauer & Pathman, 2008). By seven to nine months, infants clearly recognise the difference between familiar and unfamiliar faces.

According to Piagetian theory, the nine-month-old baby is at the sensori-motor stage of development which extends from birth to two years (Piaget, 1952). At this age, because they have limited language, babies learn through their senses and their movements. Their formation of concepts develops through doing things such as reaching, touching, kicking and pulling at objects. They suck objects, look closely at them and throw them. All these actions help separate the baby from the world around him or her and allow the baby to begin to understand how it works. At nine months, most babies will be able to locate a toy hidden in front of them. Two important capacities, 'imitation' and 'play', emerge during this period. Imitation is evident from the earliest weeks of a child's life, in simple imitative responses such as tongue protrusion (Meltzoff & Decety, 2003). By nine months, the infant imitates clapping and waving and a

range of sounds. Recent neuroscientific research indicates that the capacity to imitate may be facilitated by 'mirror' neurons in the brain, which account for the early appearance of such an apparently sophisticated skill (Iocaboni *et al*, 2005). Imitation may also underpin the capacity to empathise with others and see them as intentional beings.

Finding hidden toys and working out where an adult playing peek-a-boo has gone are common play activities but also form good examples of early problem-solving. They demonstrate the baby's growing capacity to think about the world. Vygotsky (1978) emphasised how important the adult is at this stage, introducing new experiences and 'scaffolding' the baby's attempts to solve new challenges. Much of the infant's early learning occurs through play and through playful interactions with caretakers.

2.3.6 Communication and language

Communication is both verbal and non-verbal but it is through the understanding of language and language production that the child becomes a fully competent member of society and it is through language that cognitive development is advanced. Language skills are central to the child's cognitive development and are key to the human capacity to think, bringing the human child well beyond the intellectual capacity of any other animal. Children's development from newborn infant to linguistically competent child is impressively rapid. When children are born, they appear to have an innate preference for attending to human voices over and above other types of sounds. Such preferences serve to orientate newborns to their immediate interpersonal and linguistic environment.

Language development follows a pattern – from the pre-linguistic stage to around six months when the baby coos and babbles, to babbling or continuous repetition of sounds at around eight months when intonation becomes more distinct and sounds can signal emotion. At about 10 months the baby mixes vocalisation with sound-play, gurgling, and blowing bubbles. Thus, around nine months, typical children's babbling will contain a number of consonant vowel combinations such as 'baba' or 'dada'. The child begins to show comprehension of often-repeated words and phrases and it would be expected that by nine months many babies will show understanding of words like Mummy and Daddy by turning to look at or for the person named. By 12 months, children will have a few recognisable and appropriately applied words. Although the accumulation of vocabulary is quite slow at this age, language comprehension, or receptive language, is more advanced, in the sense that infants can understand words that they cannot produce. One study estimated that ten month olds understand three times more words that they can say (Bates et al, 1988). Babies also make a lot of use of gestures and facial expressions, not relying on language alone to communicate their needs and their emotions.

The development of communication and language in infancy is stimulated by adults' responses to infants' pre-linguistic forms of communication; talking to them, involving them and encouraging the infant to make sounds. If the quality of the learning environment is not positive and the infant is not stimulated by adult interaction and communication, his or her ability to develop healthy communication and language skills may be compromised. Communication and language skills are developed through a combination of a predisposition to learn, environmental stimulation, imitation and reinforcement (Hayes, 2005).

2.3.7 Behavioural regularity and self-regulation

Infants vary in how soon they establish a predictable schedule of behavioural states (Thoman, 1990). Their regularity - or lack of regularity - has critical implications for infant care and development as well as for parental well-being. Being predictable and amenable to routine is in part related to temperament but it is also determined by the caretaker's own adherence to routine (Eisenberg & Fabes, 1992).

By the age of nine months, most infants can sleep through the night. This is typically an established pattern by four months, but babies can vary a lot in how much they sleep and how often they wake. In the latter half of the first year, infants who have been compliant about their bedtime routine may become fretful and difficult to settle, perhaps because they have more understanding about how to influence adult

behaviour. This may be due also to their recent achievement of an understanding of object permanence, so that they can both fear the unseen and imagine what they are missing when they are put to bed. They may need extra reassurance and soothing at this time. 'Transitional objects' such as a favourite toy or blanket can help the infant to self-soothe and self-regulate their distress.

Self-regulation refers to the baby's capacity to regulate their emotional state and behaviour. From birth onwards babies vary in their capacity to do this effectively (Brazelton & Nugent, 1995). Young babies use strategies such as thumb-sucking to deal with anxiety and hunger, and close their eyes or turn their head away when overwhelmed by stimulation. Sucking thumbs and fingers or soothers (pacifiers) will still be part of the behavioural repertoire of many nine-month-olds. Parents have a major role in helping infants of this age to learn how to manage their behaviour and how to delay gratification. As babies of nine months begin to move around more in their environment, the opportunities to get into trouble increase and there may be clashes between what the baby wants to do and what the parents think is appropriate or safe. Rothbart and Bates (2006) see self-regulation as a central component of their model of temperament, the other component being reactivity.

2.3.8 Temperament and social development

Temperament

Temperament refers to the behavioural style of the individual, which is evident in the early responses of the infant and shows some continuity across the life-course. Rothbart and Bates define it as "constitutionally based individual differences in reactivity and self-regulation, in the domains of affect, activity and attention" (2006, p. 100). It is seen as in part genetically determined, but also modifiable. Thomas and Chess (1977) carried out an early study on infant temperament (New York Longitudinal Study) where they followed the behavioural development of 133 children from early infancy to adulthood. They identified three distinct types of temperament in infants, based on nine different behavioural dimensions. Forty % of the children were described as easy children – quick to establish regular routines in infancy and generally cheerful and adaptable. Ten per cent of the children were described as difficult. They were irregular in their daily routine, slow to accept new experiences, tended to react negatively and cry a lot, and showed a greater risk of adjustment problems in later life. Fifteen per cent were described as 'slow to warm up'. They were generally inactive, a bit negative, and showed a low-key reaction to their environment. Other babies (35%) who did not fit the above categories neatly were deemed to exhibit 'no pattern'. Although the work of Thomas and Chess was pioneering and resulted in categories of temperament that are still used in some childcare circles, recent research has challenged their three-fold typology of children in favour of dimensions on which all children's temperaments can be rated.

In the current literature there are several different approaches to delineating temperament (Rothbart & Bates, 2006). Widely discussed approaches to measurement of temperament include the systems proposed by Bates *et al* (1979), Buss & Plomin (1984) and Sanson *et al* (2004).

The three qualities making up Buss and Plomin's EAS system are:

> *Emotionality,* which refers to a child's emotional reactions to environmental stimuli. A child who is highly emotional may cry easily, be more fearful, get excited quickly, or exhibit other strong emotional responses. A child low on this aspect of temperament may seem more easygoing and relaxed.
>
> *Activity* refers to a child's level of energy. Those high in this quality are seen as active, move quickly, may be more fidgety or difficult to settle down. Children low on activity are slower in their reactions and movements.

> *Sociability* relates to a person's comfort and level of interaction with others. Those high in sociability will be outgoing and more comfortable interacting in social settings. Those low on sociability are shy and inhibited, and experience anxiety around strangers or new situations.

Sanson *et al* recommend a three-dimension approach that includes *Reactivity or Negative Emotionality*, *Self-Regulation* and *Sociability*. From their review of empirical research and factor analyses of tests of temperament, they conclude that *Activity* is a fourth and less salient dimension (Sanson *et al*, 2004).

Bates et al developed the Infant Characteristics Questionnaire (1979), which results in scores on four scales that the authors argue represent the main dimensions of infant temperament. They are: *Fussy/Difficult*, *Unadaptable*, *Dull*, and *Unpredictable*.

Having reviewed the literature on child temperament, Rothbart and Bates (2006) conclude: "The general framework for temperament … includes broad dimensions of Positive Affect and Approach, Negative Affectivity, including sub constructs of Irritability and Fear, Effortful Control and possibly Affiliativeness or Social Orientation" (p. 152).

Temperament can be measured by direct observation in the home or in a laboratory setting or by questionnaires administered to a parent or caretaker. In ***Growing Up in Ireland*** infant temperament will be measured by the Infant Characteristics Questionnaire (Bates *et al*, 1979), a widely used measure that is suitable for inclusion in a survey.

The temperament of the baby is an important foundation for the baby's later personality and influences the nature of the child's relationship with the environment from an early stage. The baby's temperament and the personality, expectations and skills of parents interact to colour the quality of the parent-child relationship. Parent-child interaction is a two-way affair, and what the parent does is affected by the child and *vice versa*. If a 'lack of fit' occurs between the two, problems may follow (Thomas and Chess, 1977). Thus a very extraverted, sociable parent might find a shy child less interesting or may force the child into interactions which the child finds stressful. Children who react to challenge with intense negativity and defiance seem to prompt a coercive reaction in some parents that can become a vicious cycle, escalating over time (Calkins, 2002). On the other hand, children with difficult temperaments have been shown to become less difficult when exposed to more responsive, involved parenting (Van den Boom, 1995). This literature has been reviewed by Sanson *et al* who conclude that, while there is some supporting evidence for the hypothesis that the match or mismatch between temperament characteristics and the social environment is important, "much work remains to be done" (2004, p. 161).

Attachment

The development of a secure attachment between parent and child has important consequences for the child's development, and has recognisable phases. From birth to two months, the infant exhibits little discrimination between people, although studies have found that infants of this age can recognise and show preference for their mother's face and smell. From two to six months there is some discrimination and it may be possible to discern a distinct preference for the primary caregiver, although the infant will still interact readily with others. Between six and 12 months, most babies develop 'stranger anxiety' when they meet or are held by a stranger. They may protest when separated from their mother or primary carer. Thus, for most nine-month-olds, attachments will be in formation and evident to those around them. By 12 months, there is a clear preference for a small group of caregivers. From 12 to 18 months, when the child develops the capability to move around, the attachment figure will be used as a secure base from which to explore, and to return to when uncertain.

The quality of attachment varies from child to child and there is an important distinction in the literature between secure and insecure attachment. Secure attachment is seen as adaptive and desirable. The infant uses the parent as a secure base and, although typically distressed by her absence, is quickly comforted by her presence. Different forms of insecure attachment have been identified and insecurity is associated with both problems in the child and problems in the parent. For example, infants of anxious mothers are more likely to be insecurely attached (Symons, 2001).

2.3.9 Play

As mentioned earlier, play is one of the main ways in which the infant learns about the world. As infants get older, they learn to play new games and take a more active role in proceedings. Some nine-month-olds will have developed a fascination with dropping an object and waiting for it to be retrieved and returned so that the dropping action can be repeated. Games involving appearance and disappearance, such as 'peek-a-boo' or 'Jack in the box' are popular. A nine-month-old may also initiate passing games where an object is given away and then taken back. In Piagetian theory such behaviour is indicative of the acquisition of the concept of 'object permanence', that is, the realisation that objects do not cease to exist when they are hidden or when they are not visible to the child.

Play is an important aspect of the social interaction and development of communication between infants and adults and is essential for encouraging social, emotional, communicative and language skills in infancy. Play allows infants to explore, practise and perfect the skills that they will need for later childhood and adulthood. Through play, children regulate arousal, express a range of emotions, resolve conflicts and traumas, gain information and skills, and engage in imaginative and creative thinking (Tamis-LeMonda, Katz & Bornstein, 2002). Play encourages the child to consider other people's thoughts and intentions and provides a platform to develop social understanding. By nine months of age, the infant is more of an active partner in play and will be more likely to take the initiative in play as well as responding. The role of parents and other adults in the child's environment in initiating and responding to the child's need for play will have a critical impact on the level of stimulation the infant receives and will in turn influence the infant's developmental outcomes.

2.3.10 Socialization and compliance

Socialization is a general term for the many different ways and processes by which children come to be able to function as members of their social community. The term can imply a one-way process, with parents shaping the asocial infant into a social child. Modern views of socialization also stress the active role of children in making sense of their social world, and constructing their own ways of being part of their social group. There are also strong predispositions, visible even in very young infants, to engage and interact with other people in preference to all the other objects in the world. Infants seem to be born as social beings. But although babies come into the world with this 'preparedness' to be social, the immensely rich variety of different cultures in the world means that a lot of learning has to take place. A large part of what goes on between parents and their children is to do with 'training' children in the ways of the culture.

Part of infant training can be seen as disciplining the child – encouraging 'good' behaviour and discouraging 'bad' behaviour. Clearly, parents will differ in what they judge to be good and bad, and also differ in how they interpret the origins of these behaviours. It is likely that a minority of parents will have already smacked their nine-month-old because they see it as helpful in instructing the child about dangers in their environment or about what behaviours the parents find unacceptable (e.g. throwing food). Other parents would think that punishment of a nine-month-old is entirely inappropriate (Straus & Stewart, 1999). Some parents ascribe intentionality to even very young babies whereas others do not, waiting until the child is much older before they hold them responsible for what they do (Dix & Grusec, 1985). Some children are more compliant than others and are easier to socialise but, as noted in the previous section, children with difficult dispositions can respond well to consistent, warm parenting (Belsky, 1984).

The relationship with their primary carer, typically the mother, is the infant's first relationship and provides the basis for subsequent expectations of relationships. Bornstein and Tamis-LeMonda (2004) outline four key functions of mother-infant interactions: promotion of social understanding, development of attachment, acquisition of language, and emotional regulation. Such characteristics can be found in father-infant relationships also. It is within these relationships that infants develop a sense of what behaviours are acceptable or unacceptable within their social group. The social skills learned in the home will lay the foundation for their interactions in other settings (Lidz, 2003). By nine months, infants are already part of a complex social world and are beginning to learn how to interact with other human

beings and to regulate their behaviour in ways that are socially desirable and adapted to the ways of their family and their wider culture.

2.4 The context for Irish infants

According to the Central Statistics Office, in 2007, there were 65,495 infants under the age of 1 year: 33,707 boys and 31,788 girls (Central Statistics Office, 2007). The ***Growing Up in Ireland*** survey of 11,000 infants started in September 2008. Although it is likely that most of the cohort will have been born within the State, there will be a degree of diversity in the ethnic origins of their parents. In 2006, 13, 296 children aged 0-4 were non-Irish nationals (Central Statistics Office, 2006). There will also be considerable diversity in the context into which they are born, such as their geographical location, the age and marital status of their mother, whether they are first-born or later-born, among other important differences. A small percentage of these infants will have conditions associated with mental or physical disability, either genetically determined or acquired. ***Growing Up in Ireland*** will provide a unique opportunity to gather information on a representative sample of Ireland's newest citizens and residents and to follow them into their pre-school years.

The following sections will summarise some of the key features of the context in which Irish infants will be living and in which they will grow up. The ecological layers reflect those outlined by Bronfenbrenner; they are all important influences on the life of the infant, directly or indirectly.

2.4.1 Family

More even than for older children, the family is central to the infant's daily life. (Of the 5,247 children in care of the State in 2006, the vast majority of infants will have been in foster care – the precise figure for nine months olds is not available; Childcare Interim Dataset, HSE, 2006).

The traditional family unit headed by a husband and wife is still the most common structure for children living in Ireland today. In 2006, there were 516,413 family units consisting of husband, wife and children. The next most common family unit (with children) was a lone mother with children (162,496). There were 43,977 cohabiting couples with children and 26,717 lone fathers with children (Central Statistics Office, 2007a). There were, however, regional trends evident, with 18% of children living with a lone parent in Dublin compared to just 8.5% in County Cavan. Recent years have seen a decrease in the overall marriage rate, although there are indications that people may be postponing marriage rather than choosing not to marry at all, and may be using cohabitation as a precursor to marriage (Kennedy, 2004; Central Statistics Office 2004b). Although approximately a third of births are to women who are not married, many of them report being in a stable relationship and many will marry when the child is young, more often than not marrying the child's father (Fahey & Field, 2008).

The fertility rate in Ireland, which links the number of births to the number of women of child-bearing age, remained relatively stable during the 1990s and 2000s (at approximately 1.9 births per woman); although fertility levels have stabilised at a relatively low level by Irish historical standards, they are high by European standards. In fact Ireland continues to have the highest fertility rate in the EU27, although below the rates in the USA and New Zealand (Eurostat, 2008; Fahey & Russell, 2002). The average number of children per family was 1.4 in 2006 (2.2 in 1986). The completed family size per woman (aged 40-44) is currently 2.2. Despite the fall in family size there has been an increase in the formation of new families, with a rise in the number of first births of 57% in the years between 1994 and 2004 (Fahey & Field, 2008). Irish children are living in much smaller families than they were in the last century but are more likely than many other children in Europe to have one or two siblings.

Divorce only became possible in Ireland in 1997 but since its introduction the numbers availing of it have grown steadily. In 2002, 35,100 divorces were granted in comparison with 59,500 in 2006 (an increase of 69.8%). The number of legal separations has also increased but at a much lower rate. Clearly, both separation and divorce have major implications for Irish children (Hogan, Halpenny & Greene, 2002).

Given the late introduction of divorce, remarriage was not an Irish phenomenon on any scale until very recently, although some children would certainly have been living in informally constituted blended families.

The parenting role is seen as more challenging in the 21st century due to the rapid pace of change and the unpredictability of the future. Parenting practices will be a major focus of ***Growing Up in Ireland***, building on a small pool of existing studies (Hennessy & Hogan, 2000). The fathering role has changed markedly over the last few decades in Ireland; fathers today typically are much more involved in the care of their infants than has been traditionally the case (McKeon *et al*, 1999).

Contact with grandparents seems to be relatively high in Ireland (Hogan *et al*, 2002; Lundström, 2001), perhaps because of the small size of the country and low levels of mobility, but perhaps also because of the value placed on the extended family. The role of grandparents in children's lives is another area which needs further research. They are likely to have an important role in the lives of infants, many of them providing informal childcare and babysitting while parents return to work (Hayes & Bradley, 2006).

2.4.2 Parental income and employment

The material resources available to children are in large part, though not entirely, a function of household income. Figures for 2007 from UNICEF in relation to Ireland report that 22% of children aged less than 15 years are living in relative income poverty (set at 60% of median income per adult equivalent). This is one of the highest rates in the EU. Figures for 2005 from the CSO EU-SILC survey indicate that one in nine children under the age of 14 is living in consistent poverty (Central Statistics Office, 2006).

There is a relationship between family type and poverty. A recent survey of parents and children in Ireland (McKeown, Pratschke & Haase, 2003) found higher rates of cohabitation and lone parenthood among lower socio-economic groups. Economic insecurity is one of the variables associated with a higher probability of relationship breakdown, which often contributes to higher levels of lone-parenthood (usually of the mother) among working-class groups (McKeown *et al*, 2003). Less resources in working-class households are also likely to lead to financial strain and increased family stress, while separation itself often results in a sharp drop in the living standards of both parties, and hence the children also.

The unprecedented economic boom in Ireland over the last decade has brought high employment and new prosperity but there is still evidence of relatively high levels of income inequality and some resilient pockets of poverty, not least among households with families. Unfortunately, as noted in Chapter 1, the recent downturn in the economy is likely to bring more families into hardship. The period of economic boom was accompanied by increasing participation of women in the workforce, including mothers of young children (Collins & Wickham, 2001).

Children who grow up in poverty are less likely to be healthy and to achieve in school than their more advantaged peers. Poverty is associated with multiple risks and a higher level of negative outcomes for children in their current functioning and in the longer term (Evans, 2004). A recent Irish study confirms that the amount of time spent in poverty is a critical factor in predicting poor long-term outcomes, and those children in large families and with unemployed parents are most at risk for persistent poverty (Nolan, Layte, Whelan & Maitre, 2006). In Ireland, ending child poverty has been identified as a national policy priority in the National Action Plan against Poverty and Social Exclusion, 2003-2005 (Office for Social Inclusion, 2003) and in other major governmental policy papers and strategies. It is recognised that the most effective way to assist children in poverty is through a mixture of income supports and the provision of quality services and enhanced opportunities. However, as the economy deteriorates such actions may be severely compromised and attenuated.

Parental employment or unemployment will impinge directly on the quality of children's lives. Many nine-month-olds in Ireland will have mothers who are in paid employment, either full-time or part-time. Parental leave, paid and unpaid, will permit some mothers who intend to return to paid employment to stay at home until their child is 10 months old. Some will return to work by the time their infant is nine months old since they will not be able to afford to take unpaid leave. The 2007 participation rate for

married women in the key childbearing 25-34 year age group is at 78.6% and is 68% in the next age category, 35-44 (Central Statistics Office, 2008). Children whose mothers work at home and children whose mothers work outside the home are likely to have a different experience of home life. For example, those whose mothers work full-time spend time in out-of-home childcare, in either formal, centre-based care or informal care provided by relatives or childminders.

Where children have two working parents there may be benefits such as increased material resources but also some stresses due to neither parent being home-based for most of the day. In dual-earner couples, women do more unpaid work in the home, particularly when the household includes young children (McGinnity & Russell, 2008). The implication is that working mothers spend more time with their children or in childcare activities than working fathers. Issues of work-life balance and imbalance have been a focus of debate in recent years, as has the need to make work-life more family-friendly. While flexi-time and job sharing are well established in the public service, such arrangements are more rare and *ad hoc* in the private sector (Humphreys, Fleming & O'Donnell, 2000).

The income and material resources available to the family will be crucial determinants of the likely developmental outcomes for their children. However, it is important to note that the absolute level of resources available to the family is not as important as the way in which resources are or are not channelled to foster the development of the infant. It is known that many Irish families with young children are living in consistent poverty and find it difficult to makes ends meet (EU SILC, 2008). This is a matter for concern. ***Growing Up in Ireland*** will provide data on the extent to which families with infants are successfully managing their resources and how they are channelling their resources towards meeting the needs of their infants. It may also indicate how, despite their best efforts, some families simply do not have the resources to provide a supportive environment for their baby.

2.4.3 Childcare

As noted in the previous section, by the time their infants are nine months old, many parents will have returned to work. If both parents work full-time, the baby may be looked after for 40 or more hours per week by a (paid or unpaid) member of their extended family or by strangers who are paid to look after them. Clearly, the quality of this care is of utmost importance to the infant's quality of life and possibly to their longer-term development. According to the childcare module of the Quarterly National Household Survey in 2002, 73,100 families availed of some type of regular childcare for their pre-school children (Central Statistics Office, 2003). Relatives, paid and unpaid, were the most popular providers, numbering 31,600. Other types of care were also widely used: 21,500 availed of a paid carer and 19,800 used centre-based crèche/Montessori facilities. The vast majority (85%) of families who availed of regular childcare for pre-school children had mothers who described themselves as 'at work'. In the case of couples with pre-school children in care, the number of couples where both adults worked vastly outnumbered those with only one adult working (55,300 vs. 9,000).

However, in 2005, as in 2002 (Central Statistics Office, 2006b), childcare for most families with pre-school children was provided by a parent/guardian (60%, 122,300). For other families, the main type of care in 2005 was that provided by paid carers (12%), followed closely by unpaid relatives (11.5%). Centre-based facilities such as a crèche were the main arrangement for 20,600 families (10%), with paid relatives and other arrangements providing the remainder (4% and 2%, respectively). The Quarterly National Household Survey (administered in 2007) had a dedicated childcare module, which indicated that non-parental childcare for pre-school children increased from 42% in 2002 to 48% in 2007 (CSO, 2009). The module generated a lot of useful information on type and cost of childcare but did not break down the pre-school category into finer age categories Thus the precise number of nine–month-olds experiencing different forms of care is not known at this time, but it will be possible to arrive at a good estimation through the data collected in ***Growing Up in Ireland.***

There has been a long and heated debate on the effects of day care on children (Belsky and Steinberg, 1978; Belsky, 2005). The issues seem to be different for infants than for children aged two upwards. At nine months, infants are not yet equipped to cope well with group settings or with interaction with other infants and their emotional security requires a lot of one-to-one attention from a responsive adult

caretaker. The NICHD Study of Early Child Care, for example, found that more than 10 hours of childcare in the first 15 months of life was associated with higher levels of insecure attachment and that children who had spent a lot of time in infancy in childcare were more likely to have behaviour problems later in childhood (NICHD, 2001). Most contemporary commentators and researchers seem to converge on the view that babies are best looked after by one or more adults with whom they can develop a secure attachment (Belsky, 2005; NESF, 2005) and that, accordingly, the State should support parents in staying at home with their infants until they are at least one year old and if possible 18 months or two years old (UNICEF, 2008). A possible exception to this principle might be where parents have demonstrated an incapacity to cope with and provide for their infants, in which case centre-based infant care might provide the necessary support for both the baby and the parent (Hayes, 2008).

A recent report by UNICEF has rated 25 affluent countries on 10 benchmarks relating to the provision of early childhood care and education (ECCE) (UNICEF, 2008). Ireland comes in last, achieving only one benchmark. The UNICEF report focuses on centre-based care, while in Ireland there is considerable reliance on relatives or paid home-based childminders, so the absolute level of provision is underestimated by the UNICEF report. At the same time, high-quality childcare in Ireland is expensive, childcare is poorly regulated and there is little investment on the part of the Irish State in ECCE, making it a major policy issue for Irish policymakers and parents alike.

2.4.4 Informal supports, neighbourhood and community

Contact with the neighbourhood will be almost entirely mediated through the infant's parents and caretakers. Strong connections to extended family and to the local community serve to build social capital for the family (Putnam, 2000; Field, 2003). According to Putnam, "social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them" (Putnam, 2000, p. 19). Putnam argues that a high level of social capital is an important contributor to child development. Clearly, communities will vary in the extent to which there are strong social connections and families will vary in their connectedness to their local community. Recent Irish research relevant to social capital theory suggests that Ireland is rich in informal social networks in comparison to other economically developed countries and that there has been no decline in the number of people claiming to be active in the community. On the other hand, there seems to have been a fall in the level of interpersonal trust, and data indicate that, among OECD countries, Ireland is average to slightly below average in volunteering (NESF, 2003). Testing social capital theory is beyond the scope of ***Growing Up in Ireland,*** but some attempt will be made to assess the family's connection to their neighbourhood and community.

One indicator of connection to community is church-going. Figures from the European Social Survey 2003 suggest that 64% of people in the Republic attend religious services regularly (at least monthly), which is very high by European standards (Fahey, Hayes, & Sinnott, 2005).

At community level there are a variety of support programmes that fall under the heading of 'family support', some locally organised but funded by the State, some run and funded by charities, and some that are local community initiatives funded by voluntary subscriptions. Access to such programmes will vary considerably depending on where the family lives. Many of these programmes are directed towards families in need and will not be accessed by more affluent families. Support services for parents of infants include the Community Mothers Programme and the Teen Parent Support programmes. Barnardos is an example of a charity that runs services nationally for infants and their parents, under their Best Start programme for children aged 0-4 (see www.barnardos.ie).

At the turn of the 20th century, Ireland was still an agricultural country but it is now highly urbanised, with over 60% of the population living in areas classified as urban (CSO, 2006). Nonetheless, there is considerable variation in the nature of the neighbourhoods in which infants are growing up; one important source of difference is likely to be the contrast between growing up in the country and growing up in a city or town.

In conclusion, within the developmental systems approach, the parent-child relationship sits within a larger set of interactive systems, including other relationships within the household, with other family members and, outside the household, with the extended family, friends, neighbours and the wider community. These networks of relationships and the satisfaction with the social support received from these networks can have a significant impact on both the parent and child and also on the parent-child relationship.

Arguably, the most important social relationship for a parent is the intimate relationship with their partner. However, whether there is a partner present or not, social support can also be gained from a range of other sources: informally from other family members, friends, neighbours and other non-family, and formally from community groups and the state services.

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2.4.5 State supports

Expectant parents and parents of infants in Ireland can avail of a variety of employment and social welfare entitlements, depending on their circumstances. The following sections provide an overview of these entitlements. Information was sourced from Citizens Information (www.citizensinformation.ie), the Department of Social, and Family Affairs (www.welfare.ie), and the Equality Authority (www.equality.ie).

Maternity leave and benefit

In many countries, maternity leave is a combined period of pre- and post-childbirth leave. Since March 2007, statutory maternity leave entitlements have been extended in Ireland to 26 weeks' paid leave and a further 16 weeks' unpaid leave. During the pregnancy, expectant mothers are entitled to reasonable time off work to attend pregnancy-related medical visits and some antenatal classes. Expectant fathers are entitled to paid time off work to attend the last two antenatal classes in a set.

Under the Maternity Protection (Amendment) Act 2004, at least two weeks' leave need to be taken before the end of the week of the baby's expected birth date and at least four weeks after the birth. Employers are not obliged to pay mothers on maternity leave, although some continue to pay wages and salaries in full. In such cases, the mother's maternity benefit will be paid to her employer. Maternity benefit is received through the Department of Social and Family Affairs by women with sufficient social insurance contributions. Women who experience a miscarriage or a stillbirth from the 24th week of pregnancy onwards are entitled to the same maternity leave with benefit. From January 2009, the weekly minimum payment was €230.30 and the maximum payment was €280.

Women who become pregnant while in employment involving some exposure to hazards or risk may be entitled to health & safety leave, and health & safety benefit. They may also be entitled to this leave and benefit when they return to work following the birth if they are breastfeeding.

Adoptive leave and benefit

Under the Adoptive Leave Act 2005, adoptive mothers are entitled to 24 weeks' leave from employment. An additional 16 weeks' unpaid leave can also be availed of. Adoptive fathers are not entitled to such leave except in cases where they are the sole adopter. Prior to an adoption, potential parents can take paid time off work to attend the required preparation classes and pre-adoption meetings with social workers or Health Service Executive (HSE) officials.

Employers are not obliged to pay an adopting employee while on adoption leave. However, those with adequate social insurance contributions may qualify for adoption benefit from the Department of Social and Family Affairs. As for maternity benefit, from January 2009, the weekly minimum payment is €230.30 and the maximum payment is €280.00.

Public holidays & annual leave entitlements

According to the Organisation of the Working Time Act 1997, both biological and adoptive mothers are entitled to receive leave for any public holidays that occur during their maternity or adoptive leave.

Furthermore, annual leave can be accumulated during time spent on maternity or adoptive leave. In practical terms this can mean that mothers may take leave from employment up until the child is turning one year old.

Paternity leave

In Ireland, there are no legislative or statutory entitlements for fathers to paid paternity leave. In other words, paternity leave is not recognised in Irish employment laws. Some employers may provide for some days' paid leave for fathers, but this is entirely discretionary. However, both parents are entitled to parental leave.

Parental leave

Parental leave is gender-neutral, job-protected leave from employment (Tanaka, 2005). The Parental Leave Act 1998, as amended by the Parental Leave (Amendment) Act 2006, entitles working parents in Ireland to 14 weeks' unpaid leave – in total over the allocated period – for each of their children aged up to eight years, or 16 years in the case of children with disabilities. A person acting *in loco parentis* with respect to an eligible child can also avail of parental leave.

Generally, parents must have at least one year's continuous service with the employer before they are entitled to take parental leave. However, where the child is approaching the age threshold and the employee has more than three months but less than one year's service with the employer, then he or she is entitled to *pro rata* parental leave. Limited paid leave (*force majeure* leave) to enable employees to deal with family emergencies due to illness or injury is also covered under the Parental Leave Acts.

Unlike maternity leave, adoptive leave or carer's leave, parental leave does not qualify for a Pay Related Social Insurance (PRSI) related benefit in Ireland, despite the majority of EU member states providing such payments (Carmichael, 2002). The Report of the Working Group on the Review of the Parental Leave Act 1998 (2002) states that only 20% of eligible workers have availed of parental leave since its introduction. This report also suggests that mothers still carry the main responsibility for childcare, as 84% of parents taking parental leave are women.

Social assistance

Medical card holders are entitled to a Maternity Cash Grant from the Health Service Executive on the birth of their child. Parents who have insufficient income to meet the costs of caring for their baby can apply for an Exceptional Needs Payment from the Community Welfare Officer. Single parents can apply for a One Parent Family Payment from the Department of Social and Family Affairs.

Child benefit and early childcare supplement

Child benefit is a benefit payable to the parents or guardians of all children aged under 16, and those children under 19 years who have a disability or are in full-time education or state training (e.g. FAS, Youthreach). When the birth of a child is registered in Ireland, the Department of Social and Family Affairs will begin a claim for the child. Child benefit is paid every month for each child living with, and being supported by, their parent. The monthly rates of child benefit for those under 18 are €166 for the first and second child and €203 for the third and subsequent children. For each child aged 18, the rate is half that of a child aged under 18. From January 2010, children aged 18 years will not receive child benefit.

For twins, child benefit is payable at one and a half times the rate, and for triplets and other multiple births at double the rate. Parents of multiple births are also entitled to a special grant at the time of birth and when the children are four and 12 years old.

Parents of children aged up to five and a half years also receive the Early Childcare Supplement. This is a direct, non-taxable payment to assist families with the cost of raising children and is worth €1,104 per child, per year. However this scheme is due to end in 2010.

Maintenance allowance for foster parents

A basic maintenance allowance is available from the Health Service Executive (HSE) to foster parents and families. Since January 2008, the allowance payable for an infant or child under 12 in foster placement is €319 per child per week. For children over 12 the payment is €346 per week. The foster family will also be in receipt of insurance and a medical card for the child in care. If they have fostered the child for six months or more they are also eligible to receive child benefit.

Infant healthcare entitlements

Under the Maternity and Infant Care Scheme, which provides free antenatal and postnatal care in Ireland, mother and baby are entitled to two visits to a general practitioner (GP) after a baby is born, the first when the baby is two weeks old and the second at six weeks. At six weeks, the baby's weight, length, head circumference and hips are examined, along with an enquiry into their feeding patterns and general health.

Immunisations

Under the Childhood Immunisation Programme, vaccinations are provided free of charge to all children in Ireland. Health authorities in Ireland strongly advise that infants receive their due vaccinations. The schedule for babies born since 1st July 2008 is as follows:

- **At birth:** The BCG vaccination (a vaccine to protect against tuberculosis) is normally administered in the maternity hospital where the baby is born.
- **2, 4 and 6 months:** The '6 in 1' vaccination against diphtheria, tetanus, whooping cough (pertussis), polio and HiB (Haemophilus Influenzae Type B) and Hepatitis B. Vaccination against Pneumococcal Disease is also administered at this time in a separate injection. At 4 months, the 6 in 1 is again administered along with a vaccine against Meningococcal C in a separate injection. At 6 months, the 6 in 1 is administered for the last time along with separate vaccines against Pneumococcal Disease and Meningococcal C.
- **At 12-15 months:** The MMR (measles, mumps and rubella) vaccine is administered along with a vaccine against Pneumococcal Disease.

In relation to other affluent countries, the uptake of immunisations in Ireland has not been good (UNICEF, 2007). In 2006 the overall immunisation rate for 12-month-olds was 86% (Minister for Health and Children, 2008).

Public health nurse & the Child Health Record

A public health nurse (PHN) visits parents of new infants in their homes shortly after discharge from hospital. In 2007, 72.1% of infants were visited by a PHN within 48 hours of discharge from hospital (National Health Services Performance Indicators, HSE, 2007).

PHNs can provide advice and support on a variety of topics such as breastfeeding and feeding. They can also administer developmental checks at local health centres, free of charge. These checks are generally carried out when the infant is nine months, 18 months and two years of age. At nine months, the PHN examines the infant's eyesight and hearing, motor development, vocalisation and general growth against norms for this age group.

Mothers receive a booklet entitled 'Child Health Record' from the PHN to keep a record of their baby's development. The booklet is produced by the Health Promotion Unit and contains a height and weight chart, immunisation timetable, record of illness, and dental and developmental milestones.

Entitlements to additional or special allowances and to healthcare represent some of the ways in which families are supported by the State. Welfare services such as those provided by the Health Service Executive's social-work teams and the Family Support Agency also support families in need. In Ireland most interventions by the State in family life have been prompted by child protection concerns but there is more interest in recent years in a preventive, family support model (Dolan *et al*, 2006). The Government has launched a new initiative, the Prevention and Early Intervention Programme (co-funded by The Atlantic Philanthropies), which is supporting the implementation of internationally proven early-

intervention models in three disadvantaged areas of Dublin (Langford, 2008). Several of these programmes focus on work with infants and the mothers of infants.

2.4.6 Cultural values

Children live their lives in families, neighbourhoods and other settings with which they have direct contact such as hospitals and crèches, but the quality of their lives is also influenced by the political, legal and cultural systems in place in their society. In the Bronfenbrenner model of the child's ecology, the outer ring, the macrosystem, consists of these systems, which both represent and promote the values of the society. Values are also promoted and reproduced informally through shared traditions and taken-for-granted assumptions about what matters and how citizens should behave.

Most of the informal support for children will be provided by their families. The family in Ireland is given a special position in the Constitution as having particularly strong rights in relation to how it conducts its affairs. Article 41.1 reads:

> The State recognises the Family as the natural primary and fundamental unit group of Society, and as a moral institution possessing inalienable and imprescriptible rights, antecedent and superior to all positive law.

It has been argued that "the very high emphasis on the rights of the family in the Constitution may consciously or unconsciously be interpreted as giving a higher value to the rights of parents than to the rights of children" (Kilkenny Incest Investigation, 1993). It has also been argued that responsibility for child-rearing has been seen as belonging to the family and not to the State, and that the primacy granted to the family has hampered the development of effective child and family support services (Lynch, 1998). The State's investment in children's services and supports is relatively low in comparison to that in other wealthy countries (UNICEF, 2007).

The Irish Constitution has many consequences for Irish children. To take one example, the primacy given to the family, based on marriage, makes it difficult for any child born to a married couple to be adopted. Thus, unlike in the neighbouring UK, children taken into care are rarely adopted and Irish couples have turned in large numbers to international adoption when seeking to adopt a child (Greene *et al*, 2006)

The lives of children in Ireland are also affected by the prevailing political consensus in relation to the State's role in the social lives of Irish citizens and residents. Since the mid-1980s, Ireland has adopted a low-taxation regime in relation to income, capital and corporations. Spending on social protection (state-funded health, education, social welfare, etc) is thus lower than it is in many other comparable, affluent nations (Eurostat, 2008). Irish social policy has been characterized as "a hybrid system" (NESC, 2005), implying that it has a "mix of means-tested, insurance-based and universalist income support and service arrangements" (NESC, 2005, p. 35). Thus, there is universal child benefit and free education but no universal access to healthcare, except for a minority of people who are eligible for medical cards. In the absence of a comprehensive welfare state, Ireland relied for many years on the unpaid caring of women at home and on the religious orders. Demographic and social changes mean that most women are now working outside the home and the number of men and women in religious orders has declined dramatically. Pressure on the State has therefore increased to provide childcare for the children of working mothers and to pay for costly hospital care. Care for the intellectually disabled and the mentally ill, once provided cheaply by the religious orders, has become the responsibility of the State. Ireland is struggling to meet the welfare needs of the population while still maintaining a low-taxation regime. This implies that the infants born to parents on welfare or on very low wages may start life with significantly fewer resources than infants born to families who have adequate or generous incomes.

Irish child-rearing customs and practices have not been extensively or comprehensively documented over the modern era. Some early anthropological work highlighted the importance of family and the phenomenon of the stem family, with several generations living under one roof (Arensberg & Kimball,

1968) and the distant role of the Irish father (McKeon *et al*, 1998). More recent, small-scale studies have suggested that Irish child-rearing practices constitute a mix of traditional, authoritarian practices (e.g. a high level of corporal punishment) and modern democratic or permissive parenting styles (Greene, 1994). However, there has been no national study on this topic***. Growing Up in Ireland*** will make a substantial contribution to our understanding of this important influence on children's lives. Parental values connect closely to parental practices and, again, there has not been sufficient research on this topic in Ireland. Some early work suggests a strong emphasis by Irish parents on sociability and conformity (Nugent, 1991). In a strongly rural, homogeneous society, collectivistic values would have been important, but it is likely that in affluent contemporary Ireland, exposed to international media and multicultural influences, individualistic values have become more dominant. Parents' values have an influence on how they parent even when their children are infants. For example, parents with individualistic values are likely to emphasise and encourage early autonomy more than compliance and sociability.

The quality of life of children is influenced by the way in which children are valued and positioned within their society. In the Republic of Ireland, it has been argued, the rights of the family and the rights of parents have taken precedence over the rights of the child (Kilkelly, 2007; Children's Rights Alliance, 2008). Children have been seen as the possessions of their parents, who should be 'seen but not heard', as the old saying goes. There are signs of a new awareness of children's rights and competencies. This has been prompted by a number of processes and events. The sex abuse scandals in the 1970s and 1980s brought to the surface the terrible infringements of children's rights that took place in both state-run and religious-run institutions and in the family (Kennedy, 1979). At around the same time, children's rights were being debated and promoted internationally through the United Nations Convention on the Rights of the Child (1989), ratified by Ireland in 1992. Ireland's National Children's Strategy, mentioned in Chapter 1, epitomises the new recognition, in Ireland, of the rights and needs of children. The strategy has been accompanied by the establishment of the Office of the Minister for Children and Youth Affairs and the Ombudsman for Children, as well as other initiatives advocating for children and enabling children to have a say in matters of importance to them. The recent Programme for Government, *Towards 2016,* states Ireland's official aspiration for all its children:

> Every child shall grow up with access to sufficient resources, supports and services to nurture and care for the child and foster the child's development and full and equal participation in society. (Government of Ireland, 2006)

In 2009, the Commission to Inquire into Child Abuse issued its final report, known as the Ryan Report (Commission to Inquire into Child Abuse, 2009). The Implementation Plan was published by the Office of the Minster for Children and Youth Affairs some months later, after a period of public debate and widespread expressions of concern about the lack of protection for vulnerable children, past and present (OMCYA, 2009). The Government's commitment to improve child protection services and to hold a referendum to enshrine children's rights in the Constitution represents a heightened awareness of children and their place in Irish society.

2.5 The wellbeing of infants in Ireland

In recent years there have been a number of attempts to describe the wellbeing of Irish children. Two sources of information are particularly important: the development of child wellbeing indicators by the OMCYA and the publication, *State of the Nation's Children*, based on those indicators (Hanafin & Brooks, 2005, 2008), and the international comparisons conducted periodically by UNICEF using its own child wellbeing barometer (UNICEF, 2007). The data used in the latter relate almost entirely to older children and are less relevant to infant wellbeing specifically. In the *State of the Nation's Children* report, many important basic statistics on infant wellbeing are outlined, some of which have already been mentioned.

All told, Irish infants have a good chance of being born healthy and surviving infancy. The significance of such facts cannot be underestimated when the fate of infants is considered from a global perspective. However, it seems clear that, as affluent countries go, some babies born in Ireland have less access than others to the resources needed to ensure their optimal development. It is hoped that the data

collected in ***Growing Up in Ireland*** will add considerably to the growing pool of information on infants in Ireland and their families and that the study will inform public debate on how best to ensure the welfare of all children born in Ireland and to enable all Irish infants to develop their full potential.

Chapter 3

FACTORS INFLUENCING PHYSICAL HEALTH AND DEVELOPMENT

CHAPTER 3: FACTORS INFLUENCING PHYSICAL HEALTH AND DEVELOPMENT

3.1 Health: a dynamic systems approach

The determinants of an individual's health start long before birth. The diet and lifestyle of the mother during pregnancy can have significant effects on child health and this will be explored as fully as possible in ***Growing Up in Ireland***. The development of the foetus during pregnancy can also be influenced by the people with whom the mother is in contact, particularly with regard to passive smoking. Furthermore, the mother's lifestyle choices during the pregnancy may be influenced by the attitudes of the people in her bioecological context, and by her level of education.

The mother's ability to access health services during pregnancy, at birth and in the neonatal period influences child health. Mothers who are less able to pay for services, particularly those who don't have a medical card, may attend for fewer scans or check-ups during the pregnancy. After birth, they may be less likely to attend a GP or family doctor, even if they think the infant should be seen by a medical professional. In cases where the infant has a moderate or serious condition, parents who are able to buy the treatment privately may get quicker access than those who cannot (Harkin, 2001; Farrell *et al*, 2008)

The health behaviours of parents, and subsequently the individual child, are influenced by societal attitudes and government policy. For example, at time of writing, the Government is actively promoting a breastfeeding policy among mothers which can be expected to influence the number of infants who are breastfed, at least for some period of time. Information campaigns aimed at encouraging people to eat healthily may change parent and child eating habits. As more people demand healthy food options, manufacturers respond with healthier options that affect the choice available to parents in terms of baby food. Again, however, parents' access to the best food will be affected by their ability to pay for it. Hence, the health of an individual child is determined by a number of factors, and the interactions between them.

3.2 The importance of good health in infancy

Good health is fundamental to the child's positive development. Health has been a major focus of most cohort studies of children and adults internationally. One of the longest-running cohort studies is the UK's National Child Development Study, which started in 1958 as the National Perinatal Mortality Survey, with the initial purpose "to examine the social and obstetric factors associated with stillbirth and death in early infancy among the children born in Great Britain in that one week [a week in March 1958]" (Centre for Longitudinal Studies, 2005). Even though subsequent waves and other cohort studies in the UK and elsewhere have broadened their research brief, health remains an important indicator of child and adult wellbeing. In addition, the type of data on health that can be gathered in a longitudinal study is essential for developing evidence-based health policy.

Child health is not just a matter of biology. Behaviour and attitudes are important, and there are also important issues relating to the socio-economics of accessing healthcare services, health education, and lifestyle choices. Any survey of health must consider how these factors affect health status. Pregnancy and childbirth are a time of increased health service use among most women. It is also a time when their lifestyle choices affect not just their own health but also that of their child. In the following review, therefore, we consider six key research questions relating to child health that span both the antenatal and postnatal period.

3.3 Research questions

3.3.1 How is mothers' nutrition during pregnancy, use of vitamin supplements, and use of non-prescribed medication related to child health outcomes?

Maternal nutritional status at the time of conception is an important determinant of foetal growth and development (Institute of Medicine, 1990). During pregnancy, the maternal diet must provide sufficient

energy and nutrients to meet the usual requirements of the mother as well as those of the developing foetus. Recommended intakes of vitamins and minerals such as iron and folic acid are also higher during pregnancy. International research has shown that, for those with a healthy pre-pregnancy weight, an average gain of 12.5 kg (range 10-14 kg) is generally associated with the lowest risk of complications during pregnancy and labour, and with reduced risk for pre-term birth (Williamson, 2006). Low maternal weight gain by contrast is linked to increased risk for delivery of a pre-term or low birth-weight baby, while excessive weight gain is associated with birthing complications and obesity in the mother post-partum (Abrams, Altman, & Pickett, 2000).

A number of factors are likely to affect the adequacy of maternal nutrition during pregnancy. Economic factors are likely to be important as income exerts a direct influence on both the quantity and quality of foetal nutrition (Fowles, Hendricks & Walker, 2005). This situation has long been recognised in the US and Canada where government interventions such as the Women, Infants and Children (WIC) Program and the Canadian Prenatal Nutrition Program (CPNP) have been instituted to improve the nutrition and health of low-income, nutritionally-at-risk pregnant women. Research in Ireland has pointed to socio-economic disparities in the ability to purchase nutritious foods (Friel, Walsh & McCarthy, 2004); this may provide part of the basis for the observed social gradient in birth weights across different social groups in Ireland (Institute of Public Health in Ireland, 2005).

It also seems likely that maternal education influences the adequacy of prenatal nutrition through more than its effects on income. Fowles (2002), for example, found that although most low-income women were aware of the importance of a healthy diet in promoting foetal development, few were aware of the specific nutritional requirements of pregnancy. Thus there is evidence to suggest that social inequalities are exercising their effects and shaping the life chances of the infant even prior to delivery.

Iron and folate deficiency have been shown to affect perinatal morbidity (disease) and mortality, and to increase the risk of delivery complications and low birth-weight (Ladipo, 2000). Neural Tube Defects (NTDs) are serious birth defects with symptoms that range from mild to severe impairment and are caused by incomplete development of the brain, spinal cord and/or their protective coverings. They typically occur at a very early stage in embryonic life, somewhere between 21 to 28 days after conception. Heredity and genetics have been identified as major contributors to NTDs. Indeed, the recurrence rate for having a subsequent baby affected by this condition where it has been previously diagnosed varies between 3% and 5% (Food Safety Authority of Ireland & Department of Health and Children, 2006). The results of a recent study suggest that the Irish population may be at particular genetic risk for NTDs (Kirke *et al*, 2004). Although there is no cure for this risk, the effectiveness of taking folic-acid (the synthetic form of the vitamin folate) supplementation in the period before and just after conception in preventing neural tube defects (NTDs) is now well established (Kramer, 1998). Research suggests that the protective effect is maximized if women take folic-acid supplementation prior to conception and continue up until 12 weeks' gestation (Goldberg, 2003; Buttriss, 2004).

Although the Department of Health and Children has been advising women who are considering becoming pregnant to take folic-acid supplementation since 1993, Ireland continues to have one of the highest incidence rates of NTDs in Europe, at 0.8–1.5 cases per 1,000 births (Food Safety Authority of Ireland *et al*, 2006). However, such initiatives may be frustrated by the high rate of unplanned pregnancies in Ireland (Rundle, Leigh, McGee & Layte, 2004), which means that these developing babies are unlikely to be afforded the protection of prenatal folic acid. In a study of 300 women attending their first antenatal visit in the Eastern Health Region of Ireland, McDonnell, Johnson and O'Leary (2001) found that, although 92% of respondents had heard of folic acid, only 67% were aware that it could protect against NTDs, and only 18% had taken it prior to conception. Their study pointed to a socio-economic gradient in consumption of folic acid; GMS (medical card) patients were significantly less likely to have heard of folic acid, and less likely to be aware of its importance for the developing foetus. Unfortunately the demographic profile of their sample did not match that of the Irish population as these investigators excluded groups who were unlikely to have had the same exposure to promotional campaigns (i.e. asylum-seekers and recent immigrants). Nevertheless, this small-scale study suggests interesting avenues for investigation, including variations in prenatal care and awareness among different social groups.

Many medications comprise substances with molecules small enough to breach the placental barrier and enter the foetal bloodstream. Despite this, many expectant mothers use over-the-counter and prescribed medication although little may be known about the effects of these drugs on the unborn child. For example, findings from the Avon Longitudinal Study of Parents and Children (ALSPAC) indicate that 39% of women take the painkillers paracetamol and aspirin during pregnancy (Headley, Northstone, Simmons, Golding & ALSPAC Study Team, 2004). Another ALSPAC study led by Seif Shaheen has noted recently how women who take paracetamol 'sometimes' during the later stages of pregnancy (after 20 weeks) are 22% more likely than those who never take it to have children with asthma (Shaheen *et al*, 2005). The authors speculate that exposure to paracetamol may negatively affect the foetus's developing lungs and immune system. Aspirin is also damaging for foetal development. Studies suggest that regular use is associated with low birth-weight, perinatal mortality and poorer motor and intellectual development (Barr, Streissguth, Darby & Sampson, 1990; Darby & Sampson, 1990).

Growing Up in Ireland will enable us to assess how prenatal nutrition influences weight gain and foetal development, and to determine, on the basis of Irish norms, the optimal gain associated with healthy outcomes for newborns. By identifying the characteristics of women with weight gain outside the optimal range, initiatives can be designed and targeted to improve both the health of the developing infant and that of the mother post-partum. Research under ***Growing Up In Ireland*** will also allow us to retrospectively investigate factors influencing mothers' consumption of folic acid, vitamins (e.g. iron) and other medication during pregnancy, and how these are related to short and long-term developmental outcomes.

3.3.2 How does antenatal and perinatal medical care, including the mode of delivery and the interventions used during labour, impact upon child health?

Pregnancy and childbirth are normal physiological events. However, the trend towards hospital-based monitoring and delivery has resulted in many women experiencing their pregnancy as a medical event controlled by the medical profession (Johanson, Newburn & Macfarlane, 2002; Murphy-Lawless, 1998; Oakley, 1992). Antenatal care in Ireland is also grounded in the medical model of care (Murphy-Lawless & Kennedy, 2002). As unexpected complications may arise during pregnancy and childbirth, the early detection of problems can result in mother and foetal surveillance and the intervention of specialist care. Very high proportions of expectant mothers in Ireland avail of antenatal care and visit their healthcare provider around a dozen times during their pregnancy (Maternity and Infant Care Scheme Review Group, 1997). Ultrasound imaging of the developing foetus is now routine practice in Ireland, as in most affluent countries. As a result many parents can be informed about the sex of their baby and about the presence of any disabilities well before birth. The implications of ultrasound screening are, it appears from recent research, often poorly understood (Garcia *et al*, 2002). Receiving antenatal care early and regularly in pregnancy is associated with better pregnancy outcomes (Enkin *et al*, 2000; Villar & Khan-Neelofur, 1998).

Poorer outcomes can often be traced to mothers' lifestyle choices, such as smoking or using drugs (this is covered in greater detail in Research Question 3.3.5), or medical problems. Medical problems during pregnancy can influence the health of the mother and the child and so careful monitoring is required. For example, mothers with gestational diabetes may experience miscarriage or premature labour, while their infants may develop jaundice or respiratory distress (Hawthorne & Modder, 2002). Blood pressure increases in women with pre-eclampsia can cause low birth-weight in infants and health problems, such as anaemia, for the mother. Serious cases where eclampsia or toxaemia develop can result in convulsions in the mother and foetal death (Lenfant, Gifford & Zuspan, 1990). According to the World Health Organisation (WHO) (1996), recommended minimum antenatal screening practices should include urine tests for bacteria and proteins, blood tests for syphilis and to ascertain blood-group type, and haemoglobin tests for severe anaemia. In ***Growing Up in Ireland*** it may possible to identify those mothers who have availed of genetic screening. This is conducted in a context where abortion is illegal except when the life of the mother is at risk.

Over 99% of pregnant Irish women give birth to their babies in hospitals (Cuidiú – Irish Childbirth Trust, 1999). The mode of delivery has a potentially wide range of effects on the outcome for both mother and

infant (e.g. Johanson *et al*, 1993). The WHO (1997) has questioned how the process of childbirth has been over-medicalised in some Western countries in recent years, with interventions involving electronic foetal monitoring and painkillers being conducted as standard practice even for typical, routine births. In Ireland, electronic foetal monitoring has become routine practice on admission to the labour ward (Cuidiú, 1999). When used without the presence of any birth complications, electronic foetal monitoring can cause undue risk to the baby and increases the likelihood of a caesarean or operative vaginal delivery (Francombe & Savage, 1993).

The use of painkillers during childbirth can provide much desired pain relief to women but is not without problems. In the days following an epidural, mothers may experience the side-effects of headaches, backaches or fevers (Vincent & Chesnut, 1998). Epidurals can also affect the baby as the medication can readily pass through the placenta, leaving the newborn less attentive, irritable, sleepy and withdrawn (Caton D. *et al*, 2002; Emory, Schlackman & Fiano, 1996). It has also been proposed that strong doses of medication during childbirth can have a lasting impact on the child's physical and mental development. Brackbill, McManus and Woodward (1985), for example, have suggested that strong doses of medication are associated with an increased incidence of learning disorders among school-aged children. Research conducted by Jacobson and colleagues (Jacobson, Nyberg, Eklund, Bygdeman & Rydberg, 1988; Jacobson *et al*, 1990) has also suggested a link between obstetric pain medication and opiate and amphetamine addiction in adulthood.

Induction and acceleration of labour are common practices in the 'active management' of first births. The primary reasons for this practice relate to the association between prolonged pregnancies and still-birth, asphyxia and birth trauma (Duff and Sinclair, 2000). Approximately half of all first-time mothers at Ireland's National Maternity Hospital, Dublin, have their labours artificially accelerated (Cuidiú, 1999). However, women may find it more difficult to stay in control of the labour after being induced. Oxytocin, a drug used in this process, can cause painful contractions whether or not a woman is in labour (O'Driscoll, Meagher & Boylan, 1993). Accordingly, it is linked with the need for greater amounts of pain-relieving drugs such as the epidural, and the chances of instrument delivery are slightly higher (Cammu, Martens, Ruyssinck & Amy, 2002).

Instrument delivery can involve the use of forceps, which are metal clamps, or a vacuum extractor (a plastic suction cup), which are placed on babies' heads to pull them from the birth canal. These instruments can be used in the latter stages of labour to assist mothers who are having difficulty pushing their baby through the birth canal within a reasonable period of time, although they too can give rise to problems. For instance, the use of forceps can increase the risk of damaging the newborn's brain and/or the mother's tissues, while vacuum extractors can result in bleeding within the newborn's head or eye (Johanson & Menon, 1998). Follow-up at age one year of babies delivered with forceps or vacuum extractor has found a small number of instances of squints and hearing difficulties (Carmody, Grant, Mutch, Vacca & Chalmers, 1986). Some studies have linked prenatal and perinatal complications and interventions, such as forceps, breech delivery and long labour, with delinquent behaviour in adolescence and adulthood (Kandel & Mednick, 1991; Raine, Brennan & Mednick, 1994). This association was particularly notable when complications were combined with maternal rejection and separation from caregiver in the first year of life.

The use of birthing aids is less commonplace today as doctors tend to intervene surgically if problems arise during labour. In Ireland, the number of babies delivered through caesarean section has risen dramatically in recent years. Just over a fifth of all births in Ireland in 2000 were caesarean (Bonham, 2004). Both mother and baby require extra support following such a delivery. For example, Liu and colleagues found that, relative to women who delivered their babies vaginally, healthy women who underwent planned caesarean sections had increased risk of cardiac arrest, hysterectomy and venous thromboembolism, among other post-partum difficulties (Liu *et al*, 2007). Newborns who have come into contact with anaesthetic medication that crossed the placenta may be less active, unresponsive and sleepy, and have breathing difficulties (e.g. Annibale, Hulsey, Wagner & Southgate, 1995; Burt, Vaughan & Daling, 1988). In addition, when caesarean babies are delivered before labour begins they have lower levels of the stress hormones that facilitate respiration, cell metabolism and circulation of blood to the brain. However, research suggests that there are few long-term negative consequences of caesarean births (Durik, Hyde & Clark, 2000) and findings from an ALSPAC study on mode of delivery and asthma

or atopy (tendency to develop an allergy) in childhood found that caesarean section deliveries were not associated with the subsequent development of asthma, wheezing or atopy in later childhood (Maitra, Sherriff, Strachan, ALSPAC Study Team & Henderson, 2004).

There appear to be many gaps in the research literature regarding differential health outcomes for children whose mothers received various forms of antenatal care and screening during pregnancy or experienced different birthing practices. The ***Growing Up in Ireland*** study will provide an opportunity to contribute to this literature by gathering relevant data from 11,000 mothers as part of the nine-month-old cohort interviews, while assessing the health status of their infants. Data will be collected on the mother's pregnancy and health history, the events surrounding the infant's birth and their health over the first nine months of life. The longitudinal nature of the study will allow for follow-up assessments throughout early childhood so that longer-term health outcomes can be recorded. It will also permit the examination of early predictors of the quality of health outcomes at nine months. At this point in time only one follow-up is planned, when the children will be three years old.

3.3.3 What are the antecedents of low birth weight among Irish infants, how is it mediated by socio-economic factors, and what are the long-term developmental implications for health and wellbeing?

Birth-weight has served as a leading indicator of infant health. One sub-group that is thought to be particularly at risk for poorer health outcomes are those born with low birth-weight (LBW). It is important to distinguish between babies born prematurely and those born at term but with low birth-weight. The two main causes of LBW are pre-term birth (before 37 weeks of gestation) and restricted growth in the womb (United Nations Children's Fund and World Health Organisation, 2004). According to figures published by the National Perinatal Reporting System (NPRS), LBW children (under 2,5000 grams) accounted for 5.3% of all live births in Ireland in 2005, the number of LBW babies as a proportion of all live births having increased by 18.2% between 1993 and 2002 (Bonham, 2005). As a public health problem, the importance of LBW stems from the close relationship between low birth-weight and neonatal mortality (death within the first month of life) and also the growing amount of evidence linking LBW to negative outcomes later in life, as detailed below. In Ireland, approximately 10% of early neonatal deaths are directly attributable to slow foetal growth, malnutrition and immaturity (Bonham, 2005), though this figure does not reflect deaths arising from complications associated with LBW. In Canada and the US it has been claimed that approximately 75% of all infant deaths can be explained by LBW (Da Silva, 1994). The cost to the public purse in terms of treating LBW and associated conditions can be substantial. Figures for Ireland are not available, but in the US it is estimated that the cost of providing specialised neonatal care is $7,500 per admission (Paneth, 1995) while the cost of caring for a LBW baby to the age of two years amounts to $200,000, according to the National Council of Welfare (1997).

Although the large majority of LBW infants enjoy normal and healthy development, as a group they have higher rates of subnormal growth, are more likely to suffer from a range of neuro-developmental deficits, and are at elevated risk for a lifetime of sub-optimal health functioning (Hack, Klein & Taylor, 1995). Indeed, investigations of outcomes for children with LBW typically show that sequelae (consequences) fall along a gradient from severe to mild depending on the extent of underweight at birth (Breslau, Chilcoat, Del Dotto, Andreski & Brown, 1996). LBW has been shown to compromise growth trajectories, as evidenced by lower height, weight and head circumference attainment relative to normal weight peers (Hack, 2006). LBW is also associated with a range of developmental difficulties in sensory, motor and cognitive functioning. These deficits include diminished visual motor skills, impaired visual and auditory functioning, and delayed speech and language (Aylward, 2005). Behavioural sequelae include internalising and externalising behaviour problems, most notably attention deficit hyperactivity disorder, as well as limitations in social competence and adaptive behaviour (Taylor, Klein & Hack, 2000). It should be noted, however, that these differences are generally small, if statistically significant.

LBW is also associated with increased risk for a number of chronic health conditions in adulthood such as cardiovascular problems, hypertension and diabetes. One study found that almost 50% of LBW children had a health condition or limitation in one or more activities that affected their everyday life, compared to 17% of a normal birth-weight group (McCormick, Brooks-Gunn, Workman-Daniels, Turner &

Peckham, 1992). Barker (1992) has hypothesised that the tissue and organs of the body go through 'critical' periods of development during which time under-nutrition of the developing foetus leads to permanent changes in the structure and operation of biological systems. For example, it has been alleged that diabetes is a consequence of poor nutrition *in utero* that may result in impaired functioning in the cells that produce insulin. If poor nutrition continues, the reduced ability to produce insulin is not a disadvantage; it becomes so only if nutrition becomes abundant, when increased demand for insulin outstrips the capacity for production (Hales *et al*, 1991).

A number of risk factors for LBW have been identified. A prior history of LBW births (Kramer, 1987), low maternal birth-weight (Simon, Vyas, Prachand, David & Collins Jr, 2006), multiple gestation pregnancy, and low pre-pregnancy weight (Kiely, Brett, Yu & Rowley, 1995) are all associated with heightened incidence of LBW. Other factors include poor weight gain during pregnancy (Institute of Medicine, 1990; Chomitz, Cheung & Lieberman, 1995) and a set of health-compromising lifestyle behaviours that have been shown to be detrimental to intrauterine development. For example, mothers who smoke during pregnancy are 2.42 times more likely to have a LBW baby than those who do not (Kiely *et al*, 1995) and research indicates that a clear dose-response relationship exists in terms of heightening risk (Nordentoft *et al*, 1996; Magee, Hattis & Kivel, 2004). The Report of the (Canadian) National Council of Welfare (1997) is unequivocal in this regard: "the relationship between smoking and low birth weight is direct and causal" (p. 5). Alcohol consumption and other substance use during pregnancy have also consistently emerged as risk factors for LBW. This message seems not to have permeated the national consciousness, as evidenced by the large number of women who continue to indulge in such behaviours during pregnancy. According to a recent small-scale survey at the Rotunda Maternity Hospital, 26% of Irish women smoked during pregnancy and 89% admitted drinking alcohol at some stage during gestation (McMillan *et al*, 2006).

Among the demographic risk factors for LBW is young maternal age and unmarried status, though it is not yet clear whether these risks hold independent of socio-economic status (Kiely *et al*, 1995). Indeed, the international literature has consistently shown that there is a clear social gradient in relation to LBW, with higher rates at the lower end of the socio-economic spectrum. In a paper exploring the social causes of LBW, Kogan (1995) describes a number of pathways through which socio-economic status can affect pregnancy outcomes. For example, Kramer (cited by Kogan, 1995) argues that socio-economic status is a social cause of other nutritional, toxic or infectious exposures which are in turn causal to LBW; while Dunn (cited by Kogan, 1995) claims that the influence of social class may be exerted through intermediate factors that may be biological (e.g. maternal weight), environmental (smoking, drinking etc) or personal (use of prenatal care) in origin. Others have pointed to the role of psychosocial mediators in attempting to understand the relationship between SES and LBW. According to Chomitz, Cheung and Lieberman (1995), stress and lack of social support may influence pregnancy outcomes via a direct physiological pathway that increases the mother's consumption of resources at the expense of the developing infant, or indirectly through their effects on prenatal care.

A small but important literature gives credence to the idea that social class affects birth-weight in Ireland. For example, Johnson, Dack and Fogarty (1994) explored the relationship between socio-economic factors and birth-weight in a number of disadvantaged areas in Dublin. They found that the incidence of LBW was significantly positively correlated with male unemployment, the percentage of population in the lower social classes, and the proportion of population covered by medical cards. Interestingly, their analysis showed that the proportion of population covered by medical cards was the best predictor of LBW, accounting for 22% of the total variance. A separate report by the Public Health Institute, which used data from the NPRS, found that in 1999 babies born to parents who were unemployed were at over twice the risk of being LBW compared to those born to higher professionals. The latest data from the NPRS confirms this finding, with 8.1% of mothers in the lowest socio-economic group having LBW babies, in contrast to 3.9% in the highest socio-economic group (ESRI, 2005).

Given the developmental implications of LBW for health and development, and its relationship with SES, it is perhaps unsurprising that the National Anti-Poverty Strategy (NAPS) has included LBW as one of three core targets to reduce health inequalities in Ireland. The ***Growing Up in Ireland*** study can contribute to the achievement of this aim by exploring the antecedents of LBW among our nine-month cohort. Better understanding of the causative factors can help inform initiatives aimed at improving birth

outcomes. It is also hoped that the study will facilitate a better understanding of how social factors translate into the biological mechanisms that affect pregnancy outcomes (Kogan, 1995). Finally, it may also allow us to determine whether there is any evidence of period effects, during which time different patterns of consumption (e.g. smoking) produce different perinatal and long-term health outcomes.

3.3.4 What role do postnatal feeding practices have on child wellbeing and development?

Although the Department of Health and Children has long advocated the use of breastfeeding as the preferred method of infant feeding (Department of Health, 1994), uptake rates in Ireland have been traditionally low, though increasing somewhat over recent years. For example, 45% of babies were being exclusively breastfed at discharge from hospital in 2007, compared with 41% in 2003 and 36% in 1999 (Health Research Information Division, 2007). These levels compare with 71 per cent in Britain and 98 per cent in Scandinavian countries. Research in Ireland suggests that the reasons for a low rate of breastfeeding may be as much societal as physiological (e.g. breast engorgement, insufficient milk) as there seems to be a continuing social stigma attached to breastfeeding in public (The Women's Health Council, 2004).

The belief that breastfeeding during infancy affords protection against a number of diseases features prominently in the medical literature. There is now considerable evidence to support this assertion. Indeed, several independent reviews and meta-analyses of the literature attest to the beneficial effects of breastfeeding for child development and wellbeing (Jackson & Nazar, 2006; National Committee on Breastfeeding, 2005). In addition to providing a rich source of nutrition for the developing infant, breastfeeding is associated with reduced risk for a number of neonatal infections including gastro-intestinal, diarrhoeal and types of extra-intestinal infections (Jackson & Nazar, 2006). The bioactive factors contained in human breastmilk are thought to buffer the newborn against disease by enhancing his or her immature immune system (Oddy, 2001). The maternal antibodies that are transmitted in the mother's milk are directed against the pathogenic substances to which the mother has been exposed in recent weeks, and as such are those that are most likely to be present in the infant's immediate environment (Peat, Allen & Oddy, 1999).

Some researchers argue that breastfeeding can influence immune-system development and affect the development of chronic disease (Jackson & Nazar, 2006). For example, a meta-analysis of 12 studies examining the relationship between breastfeeding and childhood asthma found that those who had been exclusively breastfed for at least three months were less likely to develop asthma between the ages of two and five (Zeiger, 2003). A separate review by Van Odijk *et al* (2003) found that breastfeeding reduces vulnerability to a range of atopic manifestations (dermatitis, eczema, etc), particularly those with atopic heredity; while yet another revealed that it diminishes the risk of developing childhood obesity (Arenz, Ruckerl, Koletzko & Von Kries, 2004).

In addition to bolstering the immune system of the infant, there is some support for the premise that breastfeeding promotes cognitive development in early life, possibly through positive effects on brain development. Anderson, Johnstone and Rimley (1999) conducted a meta-analysis of the available literature and found that the cognitive developmental score of breastfed children was 3.2 points higher than that of bottle-fed children after controlling for covariates such as socio-economic status and parental education. Moreover, their analysis of the data revealed that these differences manifested as early as 6–23 months, persisted through childhood (2–9 years) and were still evident in adolescence (10–15 years). Consistent with some studies in the health domain, there was clear evidence of a dose-response relationship, with longer breastfeeding exposure conferring higher cognitive-developmental gains. Finally, the mean difference in scores between breastfed and bottle-fed children was higher for LBW and pre-term infants (5.2 points) than for normal-weight infants (2.7 points), which suggests avenues for early intervention in this high-risk group. Allied to the results of other studies that found more rapid maturation of visual functioning (Birch, Birch, Hoffman & Uuay, 1992) and motor skills (Lucas *et al*, 1989), these investigators concluded that breast-milk augments neurological development.

Short-term studies have also suggested that breastfeeding is associated with post-partum recovery (Lawrence, 2005), higher levels of maternal attachment, and infant self-regulation (Woodward & Liberty,

2005). It has also been suggested that the physical closeness of mother and infant interactions during breastfeeding may encourage early bonding and attachment. In addition to assuaging hunger, the breast also alleviates distress and discomfort and may have long-term repercussions for the mother-child bond (Lawrence, 2005). Consistent with such an interpretation is the work of Fergusson and Woodward (1999) who examined the effect of early postnatal feeding practices on later psychosocial development (ages 15–18) among a sample of 999 New Zealand-born infants. Interestingly, they found that duration of breastfeeding was positively and significantly associated with adolescent perceptions of maternal care after controlling for potential confounds, though they did not find any support for the hypothesis that breastfeeding reduces the incidence of psychiatric disorders. At an earlier stage of the same study, Fergusson, Horwood and Shannon (1987) found that breastfeeding was not related to a reduction of behavioural difficulties in the children at eight years of age. In general, there is a paucity of research examining the later psychosocial consequences of early breastfeeding exposure within well-designed longitudinal frameworks. We hope to be able to contribute to this literature by examining this issue prospectively in the Irish context.

The timing and nature of the transition to solid foods is also an important area of research as recent evidence suggests that children who graduate to solid foods before six months of age may be less capable of regulating their energy intake. Ong and colleagues, for example, using data from the Avon Longitudinal Study of Parents and Children (ALSPAC), found that energy intake was higher among infants fed on formula or mixed feed, who had starting eating solid foods at four months of age, and this was related to bodyweight and BMI at ages 1–5, and to increased risk of childhood obesity (Ong *et al*, 2006). Using data from the Western Australian Pregnancy Cohort Study, Oddy *et al* (1999) found that the introduction of other milk before four months significantly increased the risk of doctor-diagnosed wheeze or atopy at six years of age.

The foregoing review has established that the beneficial effects of breastfeeding for child wellbeing may be substantive, project longitudinally, and affect diverse spheres of physiological and psychosocial function. However, the method of infant feeding is correlated with socio-economic factors such as income, parental education, family size and family structure – any or all of which may moderate or mediate the relationship with child health (Woodward & Liberty, 2005). Furthermore, the belief that breastfeeding necessarily protects against asthma and other related atopic symptoms has not gone unchallenged. Sears *et al* (2002) followed a cohort of 1,037 subjects for 26 years and found that breastfeeding for four weeks actually increased the risk of asthma and allergic symptoms, and this has prompted fierce debate in the literature (Peat, Allen, Oddy & Webb, 2003). Similarly, although research has increasingly revealed evidence of a dose-response relationship (National Committee on Breastfeeding, 2005), other studies have demonstrated that health benefits may not be conferred if breastfeeding is of short or limited duration (Raisler, Alexander & O'Campo, 1999). ***Growing up in Ireland*** provides an opportunity to make a contribution to this important literature within a framework that can take adequate account of these potentially confounding explanations. It will also allow us to explore the physical, social and economic reasons for low rates of initiation within our nine-month cohort.

3.3.5 What is the influence of maternal use of tobacco and alcohol during pregnancy for an infant's health and development?

Maternal use of substances during the gestational period has been implicated in the compromised development of children born to mothers who use these substances during pregnancy, and associated with increased risk for a number of physical, neurological and behavioural deficits (Faden & Graubard, 2000). Research in Ireland indicates that smoking and drinking during pregnancy continues to be a major public health problem. According to a study which examined self-reported substance use among pregnant Irish women, almost 50% of those who had smoked prior to pregnancy continued to smoke during pregnancy; and almost 87% of those who drank alcohol prior to pregnancy continued to drink during pregnancy (Barry, 1993).

Smoking

It is well established that maternal smoking during pregnancy has damaging effects on foetal growth and development (Kramer, 1987), with research pointing to a clear dose-response relationship (National

Council of Welfare, 1997). One of the most consistently documented consequences is an elevated risk for delivery of a pre-term or intrauterine growth-retarded (IUGR) baby (Andres & Day, 2000). These effects have been observed in a large-scale Irish study (Barry, Kearney, Lawlor, McNamee & Barry, 2006). According to a recent Canadian report, babies born to women who smoke during pregnancy are 150–200 grams smaller on average compared to those who do not smoke (National Council of Welfare, 1997). Research has shown that smoking is associated with a range of other adverse pregnancy outcomes including placental abruption and placental praevia, congenital malformations, and perinatal mortality (Van Meurs, 1999). According to a recent review paper, it is also associated with a fivefold increase in the risk of infant death due to SIDS (Sudden Infant Death Syndrome) compared with the children of mothers who do not smoke (Mitchell & Milerad, 1999). It is believed that the physiological effects of maternal smoking on foetal development are due to the impaired circulation of nutrients and oxygen to the foetus that inhibits growth (Law *et al*, 2003).

An accumulating literature provides support for the idea that smoking during pregnancy can disrupt the development of foetal systems and organs, and may predispose to a number of chronic health conditions in later life. A large number of studies have demonstrated a link between maternal smoking, impaired lung function and increases in respiratory symptoms in infants (Le Souef, 2006). Hanrahan and colleagues, for example, found that infants whose mothers smoked during pregnancy had diminished lung function when assessed at six weeks of age (Hanrahan *et al*, 1992), and this effect was still apparent at 18 months (Tager, Ngo & Hanrahan, 1995). Furthermore, the available evidence suggests that this alteration in lung function is due to prenatal rather than postnatal exposure. A UK cohort study of 12,743 children found that postnatal cigarette exposure exerted a significant influence on the incidence of bronchitis, but this was less than the effect of *in utero* exposure (Taylor & Wadsworth, 1987). However, these results do not lessen the impact of postnatal tobacco exposure on infants, as these have been found to be substantial. Li, Peat, Xuan and Berry (1999), for example, found that children exposed to environmental tobacco smoke were almost twice as likely to have a serious respiratory tract infection requiring hospitalisation compared to those not exposed.

Apart from the adverse physical health outcomes associated with tobacco exposure, prenatal cigarette smoking has been shown to double the risk of the infant being a non-babbler at age eight months (Obel, Henriksen, Hedegaard, Secher & Ostergaard, 1998) and with persisting language deficits at one, two and three years of age (Fried, 1989). Other deficits include poorer habituation to auditory stimuli (Fried & Makin, 1986) and lower cognitive scores at age three (Fried & Watkinson, 1990). The results of a small-scale longitudinal study indicate that maternal smoking is associated with a fourfold risk of pre-pubertal onset of conduct disorder in boys and a fivefold increase in the risk of drug dependence of women relative to a control group (Weissman, Warner, Wickramaratne & Kandel, 1999). The level of prenatal maternal smoking will be assessed in ***Growing Up in Ireland.*** It will be possible to examine its correlates and consequences in this large and nationally representative Irish sample

Drinking

It is recognised that heavy drinking during pregnancy can have devastating consequences for foetal development (Santrock, 2007). Alcohol crosses the placenta and reaches the foetus in the same concentration as in the mother, but, because of the immaturity of developing systems and organs, cannot be efficiently eliminated from the system (National Council of Welfare, 1997). Zhang *et al* (2005) have detailed how alcohol consumption during pregnancy can increase the vulnerability of the developing foetus to illness and other chronic conditions due to changes in the normal maternal-foetal hormonal balance. Although in recent years pregnant women have been advised not to drink alcohol at all, this advice may be challenged by new data from the UK Millennium Cohort Study, which found that women who had drunk a small amount of alcohol during pregnancy did not have children with a raised incidence of health and behavioural problems. In fact, boys born to light drinkers (defined as one drink every so often to two drinks per week) were found to be 40% less likely to have conduct problems and 30% less likely to be hyperactive at age three than were boys born to abstainers (Kelly *et al*, 2008).

The teratogenic (malformation-causing) properties of alcohol on foetal development are most apparent in those with Foetal Alcohol Syndrome (FAS). This encompasses a range of abnormalities that include low birth-weight, retarded growth, facial deformities, defective limbs, and diminished intellectual function (Santrock, 2007). However, there is continuing debate as to whether the risks associated with alcohol

consumption are dose-dependent, and at present it is not known whether there is a safe level of alcohol consumption during pregnancy. A meta-analytic study that examined the effect of alcohol exposure during the first trimester on congenital malformations found no increased risk at moderate levels of consumption (Polygenis *et al*, 1998). A prospective Australian study (n = 8,556) found that moderate consumption in early or late pregnancy had no independent effects on weight or head circumference when measured at birth, and again at age five years (O'Callaghan, O'Callaghan, Najman, Williams & Bore, 2003). Similar conclusions were reached by Olsen (1994) who found no evidence of adverse developmental effects for moderate consumption among a Danish sample (n = 261) who were tracked longitudinally. It is difficult to reconcile the findings of these studies with those of other longitudinal studies which have reported a variety of adverse developmental effects, even at moderate levels of consumption. These include lower mental test scores at age four and a half (Larroque & Kaminski, 1998), and poorer motor development at age four (Streissguth, Barr, Sampson, Darby & Martin, 1989).

There is considerable interest in the impact of maternal exposures during pregnancy on neonatal and long-term outcomes. The ***GUI*** study offers an opportunity to determine whether developmental outcomes vary by the timing, nature and frequency of these exposures, and whether the effects are dose-dependent. The sample size should be large enough to permit robust analyses concerning differential outcomes for the infants of mothers who smoke and/or drink alcohol during the prenatal and postnatal periods, compared to those who discontinued smoking and drinking during pregnancy, or those who have never smoked or consumed alcohol. One of the obvious difficulties in attempting to tease out the specific effects of various substances on development is that patterns of consumption tend to co-vary and studies have not always been able to take adequate account of this. Moreover, a number of other factors (e.g. socio-economic status, nutrition) may conflate the results. The ***GUI*** study, however, will be able to control for these covariates. One problem is that the data rely on the accuracy of parental reports about past events, which is known to be less accurate than contemporaneous accounts (Pless & Pless, 1995)

3.3.6 What are the implications for infant health of early childcare?

Much of the research into the effects of childcare on health has taken place in the USA. The National Institute of Child Health and Development Study of Early Child Care (over 1,000 children) found that infants in either centre- or home-based care settings were at a greater risk of ear infections and upper respiratory tract infections (NICHD, 2001; 2003). Children in centre care were at a greater risk of stomach illnesses compared to other non-parental care settings. For children in large group settings (more than six children), there was an increased risk of upper respiratory infection, stomach illness and ear infections compared to children who were cared for at home or in smaller group settings. In a review of findings, Shope and Aronson (2005) report that, along with an increased risk of middle-ear infections and requirements for ear grommets, children in large-group care receive more treatments with antibiotics, are more often colonised by antibiotic-resistant bacteria, and require more healthcare visits than children in home or small-group care. These authors also report that close proximity and sharing of objects and foods lead to more outbreaks of infectious diseases such as salmonella, shigella, giardia and hepatitis A. They also note, however, that the vast majority of these infections are quite mild.

In relation to other health indicators, Shope and Aronson (2005) report that children in home-based care have a higher incidence of injury than those in either centre-care or parental-care settings. Furthermore, children receive fewer injuries while in centre-based care than when at home. Falls from climbing equipment are the most common cause of, and result in the most serious, injuries.

The contraction of illness in infancy can have other implications for child development. For example, increased illness may result in increased administration of medication, such as antibiotics, which can in itself have implications for future child health. Exposure to antibiotics in infancy is associated with increased risk of asthma (Marra *et al*, 2006) and atopy (tendency to develop allergies) in certain groups of children (Cole Johnson *et al*, 2005). The use of the antibiotic amoxicillin during infancy has been linked to defects in the tooth enamel of permanent teeth (Hong *et al*, 2005). Elsewhere, experience of chronic ear infections for children in childcare has been associated with poorer attention in book-reading sessions (Feagans, Kipp, & Blood, 1994). Lamb and Ahnert (2006) suggest that the differential rates of

illness for children who have experienced childcare might explain some of the inconsistencies in findings examining the effect of early childcare on linguistic and cognitive competence.

However, early exposure to illness or infection through care settings may not be entirely bad news. The NICHD study referred to earlier found that, while children in childcare had significantly more illnesses in the first two years of life than those in parental care, by the age of three years these differences were no longer significant (NICHD, 2001). Furthermore, those children who experienced large-group care in their third year were less likely to get stomach illnesses and upper respiratory tract infections in the early school years (NICHD, 2003). In other research, the increased exposure to common infections in the first year of life through participation in group childcare was found to reduce the risk of developing acute lymphoblastic leukaemia in childhood (Gilham *et al*, 2005). A meta-analysis by Kaila and Tayback (2001) suggested a protective role for early exposure to infection through childcare in the development of Type 1 diabetes, at least for some sub-groups. Hence, the opportunity to mix with other children and be exposed to common infections may help to bolster the immature immune system in at least some cases.

Considerations for infant health and safety in the childcare environment are particularly important considering the increasing use of childcare in Ireland. While the Government has developed detailed guidelines for formal pre-school services, findings from the Quarterly National Household Survey (QNHS) show that most childcare is provided informally, often by unpaid (and presumably) untrained relatives (see section 2.5.3). By recording information directly from carers, as well as longitudinal information on child health, ***Growing Up in Ireland*** will provide a unique opportunity to examine the short, medium and long-term health implications of various types of childcare.

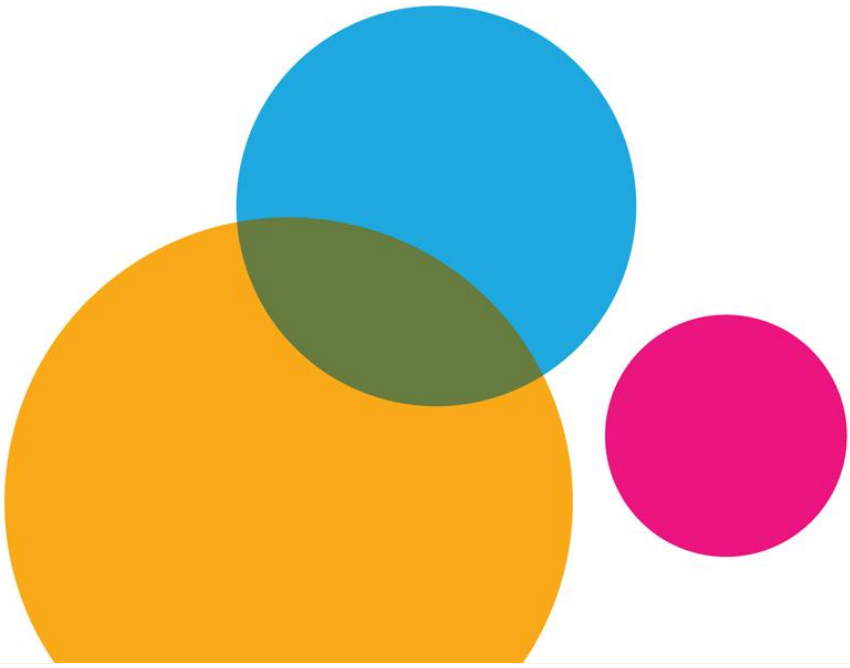
3.4 Summary

The above review underlines the importance of studying health prospectively so that we can see how individuals achieve both positive and negative health outcomes. It is also necessary, however, to gather some data retrospectively on behaviours and healthcare during the pregnancy so that we may have a more complete picture of the factors that influence health. While in some areas, it seems as if much is already known – for example, on the effects of smoking and drinking alcohol – it is still important to gather data that are specific to the Irish context. It will also be important to account for the contribution of any known, or potential, influential variables when assessing the impact of any other variables of interest in the future. Likewise, such data will be useful in investigating why some children at risk of a poor health outcome because of conditions during the gestational period do not display the expected negative outcomes.

One cannot consider an individual's overall wellbeing without considering their health status. In addition, policies for the promotion of healthy behaviours need to be informed by a comprehensive dataset. It is only through the use of longitudinal data that the impact of any policies may be adequately assessed. ***Growing Up in Ireland*** will be the first Irish study to describe infant health on such an extensive scale. Child health outcomes assessed will include children's height, weight and achievement of developmental milestones, their health history and their current health status. The data collected will form an important source of information, not just for policy-makers, but for health professionals and researchers across a wide range of domains.

Chapter 4

FACTORS INFLUENCING SOCIAL, EMOTIONAL AND BEHAVIOURAL WELLING AND COGNITIVE DEVELOPMENT



CHAPTER 4: FACTORS INFLUENCING SOCIAL, EMOTIONAL AND BEHAVIOURAL WELLBEING AND COGNITIVE DEVELOPMENT

4.1 Introduction

In this chapter the focus will be on outcomes associated with the child's psychological wellbeing, behavioural competence and cognitive development. Whereas in the literature review relating to the nine-year cohort, intellectual and educational outcomes are considered apart from social, emotional and behavioural outcomes, in this review all these outcomes will be considered together, in the same chapter. At this early stage in the child's development, the same factors that produce positive outcomes in social development will tend to produce positive outcomes in cognitive development, and it is not always as easy to distinguish between outcomes and their likely determinants as it is in an older child. For example, social wellbeing and positive cognitive development tend to go hand in hand. A child whose parents interact with him or her in an engaging and stimulating manner is likely to be being supported in both social and cognitive development (Cox & Harter, 2003). Education is informal at nine months of age; there is not a separate realm for education, involving an institution outside the home and adults whose job it is to educate children. Thus, even if the nine-month-old infant is in a childcare setting, the 'education' to which the child is exposed occurs via everyday caring, through close relationships and through play. It is typically indistinguishable from the other nurturing activities offered by the caring adults in the infant's life. Where there are clear connections between early determinants and specific infant outcomes, these will be emphasised. For example, it seems that living in persistent poverty may have specific effects on cognitive outcomes (McLoyd, 1998).

4.2 Social, emotional, behavioural and cognitive outcomes from a dynamic systems perspective

As in the case of physical health, the most important influence on the quality of children's psychological wellbeing is their parents' (or parent's) behaviour. Although parents are critically important, they are not the only influences on their children's psychological wellbeing. When the baby is born, two other important influences have already come into play: the baby's genetic make-up and the uterine environment. As developmental scientists attempt to disentangle the effects of these different early influences, it is clear that the picture is complex. For example, harsh parenting, apparently resulting in anxiety and behavioural problems in the young child, may not solely impact in terms of what the parent does to the baby, but may also impact as a consequence of shared, genetically determined dispositions to an irascible temperament (Rutter, 2006). The advances in our understanding of gene-environment interaction have been impressive in the last few decades and have put paid to simplistic ideas about the contribution of nature versus nurture.

Children's own characteristics are understood to influence the reactions of those close to them, both directly and indirectly. Psychologists distinguish between evocative and active modes of influence. A child who is perceived by adults to be attractive will evoke more attention than a child perceived as unattractive (Langlois *et al*, 1995). Children also actively seek out niches in which they are comfortable or which suit their proclivities. Thus an energetic boy infant may seek out opportunities for rough-and-tumble play and as a child be more likely to find opportunities to run and jump and kick a ball. Scarr and McCartney refer to this behaviour as niche-picking (1983). Although most of the early work on gene-environment interaction focused on intelligence, there is a lot of attention also on the origins of individual differences in socio-emotional development and in the roots of behaviour problems.

Environmental factors have a large part to play in shaping children's social and emotional and behavioural wellbeing. Again, the influence may be direct or indirect. It is well established that certain parenting styles are more likely than others to be positively correlated with good outcomes for children (Baumrind, 1971). However, it should be borne in mind that there are exceptions. Authoritarian parenting may be functional for children who have to face harsh social settings outside the home (Steinberg *et al*, 1991). Also, returning to a point made earlier, some of the correlation between, for example, calm and

controlled parental behaviour and calm and controlled child behaviour may be a consequence of shared genetic material between the child and parent.

An interesting phenomenon which serves to illustrate the particularity of each child's experience is that siblings from the same family are often quite different in personality and levels of adjustment despite having the same parents. This may be in part due to an active desire on the part of the child to forge his or her own identity within the family (Feinberg & Hetherington, 2000). It may also be a result of the individual constitutional make-up of every child and the way in which each infant-parent relationship finds its own dynamic. The special dynamic may be influenced by the interaction of child variables, such as the sex of the child, their position in the family and their temperament, with parent variables such as stress levels and general happiness (Kuczynski, 2003) or may be a function of 'goodness of fit', as discussed later.

The arrival of an infant, however welcome, inevitably brings change to the family, and places new demands on the family members. In turn, the infant's development and wellbeing will be heavily influenced by the family in which he or she grows up. For example, an important, relatively new family form in Ireland is the lone-mother family, where the mother parents alone from the birth of the child onwards. This family form was, in the past, typically the result of bereavement or separation, but is increasingly due to mothers making the choice to rear infants alone without partners (Nixon, 2007). Many of these mothers marry or co-habit in time (CSO, 2007). The effect of non-traditional family structures and changes over time in family composition within the same family can be effectively tracked in the ***GUI*** study.

Beyond the infant-parent dyad we have other important areas of both direct and indirect influence. Other people in the child's family will exert an important influence on the quality of their daily lives; these include their siblings and their grandparents.

Influences on the parents' lives shape the baby's life experience indirectly (Belsky, 1984). Where two parents are living together, the quality of their relationship is an important influence on the wellbeing and behaviour of both parents. The parents' relationship with the outside world is also important. Thus job satisfaction and feeling connected to the local community may serve to bolster the parents' wellbeing and their capacity to provide loving care to their infant. At a broader level, the legal and welfare systems of the society in which the child is growing up may provide strong or weak support to parents as they bring up their young child. In Ireland there has been some discussion about the extent to which parents and their young children are supported by the formal and informal institutions of the State (Children's Rights Alliance, 1998; Devine, 2008)

The following questions are examples of some of the issues pertaining to children's psychological and behavioural development that will be addressed in the survey of the Infant Cohort of ***Growing Up in Ireland.***

4.3 Research questions

4.3.1 How does parents' behaviour influence the security of infant attachment?

The primary responsibility of parents is to ensure their baby's survival. But the parenting of infants extends far beyond the responsibilities of feeding them and ensuring their health and safety. The period from birth to two years is an important time in the development of the child as a social and emotional being. The relationships formed with the parents or other primary caregivers at this time are regarded as some of the most important in the life of the individual. In this review, we consider the existing literature on the influences on children's behavioural, social and emotional wellbeing with reference to key questions that arise in this area.

Since the work of English psychiatrist John Bowlby in the immediate aftermath of the Second World War and its elaboration into a theory about the mother-child relationship in the 1960s and 1970s (1951;

1969), the child's secure attachment to his or her caretaker has been seen as a critical indicator of child emotional and social wellbeing and an important foundation for their future wellbeing.

In 1969, Bowlby defined attachment as an enduring emotional bond characterised by a tendency to seek and maintain proximity to an attachment figure, particularly during times of stress. This behaviour has the adaptive evolutionary function of protecting the infant from danger in its vulnerable early years. An attachment is a close emotional bond between parent and child that incorporates a sense of security for the child. It is seen to be adaptive for the species and built into our behavioural repertoire. Compared to other species, humans are born relatively immature and hence are completely dependent on their parents to meet their most basic survival needs. It has been suggested that human adults are hard-wired to respond in a nurturing way to 'baby faces': eyes that are low down on the face, and proportionately large and widely spaced; round face, button nose; etc (e.g. Lorenz, 1935 in Bornstein, 2002).

Development of attachment

While parents, especially the mother, may feel a bond with the child even before it is born, the child's attachment to the mother or primary caregiver develops over months and years. Even though infants a few days old show, in experimental conditions, a preference for their mother's smell over that of other women, they do not normally show a marked preference for particular caregivers until they are seven to nine months old (Boris, Aoki & Zeanah, 1999). Between two and seven months, they may interact differently with particular caregivers but do not usually display 'separation protest' when parted from primary caregivers. Typically, a preferential attachment to a caretaker is well established by nine months. Also, at this age and earlier, infants begin to display wariness or even distress in the presence of strangers (Bowlby, 1969).

As the child becomes capable of independent movement around his or her environment at about one year, the attachment figure becomes a secure base from which to explore, and a safe haven to which the infant returns when threatened. From two to four years, the child is able to tolerate longer absences from the attachment figure, which facilitates the development of relationships with others such as peers and teachers. Bowlby viewed these early attachments as the basis for internal working models of relationships, incorporating representations of the self and others, which influence the organisation and development of close relationships in the future.

Assessing quality of attachment

Following from Bowlby, Ainsworth's work on the development of the Strange Situation Procedure (Ainsworth, Blehar, Waters & Wall, 1978) as a means of classifying the quality of that attachment has been highly influential. The procedure takes place in a novel environment where the child encounters a stranger and experiences separation and reunion from the caregiver (normally the mother). Observations of the child's behaviour during this episode facilitate the classification of the child's attachment as either secure or anxious (insecure). A securely attached child is happy to explore the environment in the mother's presence but returns to her if threatened. She is happy to be reunited with the mother after an absence and shows a clear preference for the mother over a stranger. Approximately 65% of infants are classed as securely attached when assessed by the Strange Situation Procedure (Colin, 1991), which is a widely used technique for assessing the quality of attachment. The percentage can vary markedly depending on the population under consideration.

There are three sub-types of insecure attachment:

- *Detached/avoidant* attachments are characterised by avoidance of contact with the mother, especially at reunion, and no preference for the mother (approx. 20% of infants).
- *Resistant/ambivalent* attachments are characterised by a reluctance to separate from the mother, great upset when the infant is separated but not comforted on her return, both seeking and rejection of contact with the mother, and wariness of strangers (approx. 10–15%).
- *Disorganised/disoriented* attachments are characterised by confusion on behalf of the child and the display of contradictory behaviours towards the mother (approx. 10–15%) (Bee & Boyd, 2007)

In a study of 100, mainly working-class Dublin toddlers (aged 18 months), 80% were classified as securely attached, 15% as insecure-avoidant and 5% as insecure-resistant (Wieczorek-Deering, Greene,

Nugent & Graham, 1991). The authors note that the level of secure attachment is unusually high in this Irish sample relative to other international findings. In general, the quality of attachment tends to remain reasonably constant over time. However, when circumstances change, for good or ill, the quality of attachment often changes in line with the new circumstances. (Bee & Boyd, 2007).

It will not be possible in ***Growing Up in Ireland*** to use any measures based on direct assessment such as the gold-standard approach to assessing the quality of infant attachment, the Strange Situation Procedure (Ainsworth *et al*, 1978). Instead ***GUI*** will rely on brief questionnaire-based assessment of parents' depth of emotional attachment to their child. The nine-item Quality of Attachment sub-scale from the Maternal Postnatal Attachment Scale (Condon & McCorkindale, 1998) will be administered to mothers and an abbreviated version to fathers. Mothers will also be asked to report on how the infant reacts to separation and reunion.

Determinants of attachment

Two aspects of the parent or caregiver's behaviour have been identified as crucial to the formation of a secure attachment: *emotional availability* and *responsiveness*. A parent must be both willing and able to form an emotional attachment to the child; circumstances such as mental health problems or dire economic circumstances may impede this ability. A responsive parent is one who is sensitive to a child's signals and needs, and responds to them appropriately. Positive maternal characteristics of autonomy, flexibility and nurturance have been associated with secure attachments in infants (Colin, 1991). Rejection of the infant's attempts to make contact is associated with insecure-avoidant attachment, and inconsistent responding with ambivalent attachment. Grieving, maternal psychopathology and a history of abuse are associated with disorganised attachment. In the aforementioned Dublin study, secure attachment at 18 months was associated with higher maternal sensitivity and ego strength in the neonatal period; higher level of paternal involvement in child-rearing; married instead of single motherhood; and easier neonatal temperament (Wieczorek-Deering *et al*, 1991).

However, attachment formation is not a one-way process and increasingly researchers are acknowledging the active role of the child. It is also argued by some researchers that the temperament of the child is what determines the quality of attachment, rather than the responsiveness or the sensitivity of the primary carer (Lamb, Thompson, Gardner & Charnov, 1985). Parents may find it more difficult to form an attachment with a temperamentally 'difficult' child or with a child who has a serious biological problem such as autism. For many years mothers were blamed for causing autism by being too 'cold' in their interactions with their autistic child (so-called 'refrigerator mothers'). It is now acknowledged that it is more difficult to interact warmly with a comparatively asocial autistic child, and not the other way round. Furthermore, infants can form different qualities of attachments with different caregivers (Boris *et al*, 1991).

Importance of attachment

The importance of the quality of attachment to one's parents has been demonstrated in many studies. Bee and Boyd (2007) summarise the research findings: children who are securely attached are more sociable, have more positive interactions with peers and siblings, are less dependent on teachers, less aggressive, and have greater emotional maturity and higher self-esteem than those with insecure attachments.

Securely and insecurely attached children perform at a similar cognitive level but securely attached children tend to approach tasks in a much more positive way (Colin, 1991). Some researchers argue that a secure attachment is a protective factor against future negative circumstances and that insecurely attached children are at increased risk of future psychopathology. Others would argue that attachments can change and that the child's emotional life is about more than their early attachment to one key figure (usually their mother) (Kagan, 1998). Characteristic behaviour and coping styles associated with avoidant, ambivalent and disorganised attachments may prove to be maladaptive in later life, if they persist. There is some evidence that attachment style in childhood may be carried through to affect later adult relationships (Mikulincer & Shaver, 2005), and even through to the attachment to one's own children (van Ijzendoorn, 1995). It is important to bear in mind that these apparent continuities from early

life may be due to other intervening events, and that a secure attachment on its own is neither sufficient nor necessary for positive life outcomes.

4.3.2 Do parents who display a closer bond to their infants have children whose development is enhanced?

Most mothers report strong feelings of affection for the child even before birth (Boris *et al*, 1991). For some mothers this attachment develops in the first trimester but for the majority it is prompted by the first movements of the foetus (Lumley, 1982). Fathers' feelings are generally not as strong during the pregnancy stage although they increase in the last trimester. For most parents, seeing their child for the first time at birth is a very special and intense moment, and increasingly fathers in the Western world are present at the birth. In one Danish survey (1998-9), it was found that fathers were present at 88% of births (Madsen, 2004). In Western cultures, around 95% of mothers and fathers report feelings of love for the infant by the time it is one month old (Zeanah, Zeanah & Stewart, 1990).

In the first few weeks of life, mothers and fathers interact with the baby in similar ways: touching, talking and cuddling the baby, and displaying similar physiological reactions (increased heart rate and blood pressure) when interacting with the infant (Corter & Fleming, 1995). A pattern of interaction between parents and infant develops, where parents respond to the need signals of the infant, such as crying, and the infant responds to the parents' smiles and baby-talk (*motherese*) by orienting towards the parent, smiling, and so on (Bee & Boyd, 2007). The refining and smoothing of this interaction has been termed *synchrony* (Isabella, Belsky & von Eye, 1989), and its development is considered critical for the formation of a bond between parent and child. Some parents and some infants seem more proficient at contributing to this synchrony than others. Horowitz, Logsdon and Anderson (2005) list the documented negative consequences for the infant of difficulties in mother-infant interaction as impaired cognitive and emotional development, poor social skills and insecure attachment.

Some changes in mother and father interaction emerge after the first few weeks: fathers engage in more physical or rough play, whereas mothers engage in more routine caregiving, smiling and talking (Parke, 1995; Ricks, 1985); however, this pattern may be culturally determined (Parke & Buriel, 1998). There is also some evidence that fathers spend more time interacting with their infant sons than their infant daughters, in terms of both play and more routine caregiving (Lundberg, McLanahan & Rose, 2005). In a study examining American parents' separation anxiety towards their infants, Wille (1998) found that mothers were more concerned about separation and employment-related separations than fathers. Mothers who preferred to be employed had fewer employment-related separation concerns, and, when infants were six months old, mothers had fewer of these concerns when the father was more active in caring for the infant. Fathers who reported finding it difficult to leave their infants and return to work also reported higher levels of separation anxiety than those fathers who were happy to return to work. In a study of American first-time mothers, Hsu (2004) found an association between general maternal separation anxiety and over-sensitivity to negative signals from the infant coupled with under-sensitivity to positive signals.

The debate continues as to whether the period immediately after birth is critical for the bonding process. Despite popular belief, the research suggests that babies who are not held by their mother immediately after birth are not at an increased risk of emotional problems (Santrock, 2007). Research has found, for example, that adopted children can and do form secure attachments to their adoptive parents (Stams, Juffer & van Ijzendoorn, 2002).

Traditionally, parent (usually mother) and infant interactions have been assessed using direct or videotaped observation. This method is not possible in a survey such as the ***Growing Up in Ireland*** study. Behaviours of interest typically include the mother's sensitivity and responsiveness to the child's needs, her positive and negative affect when dealing with the child, and the extent of face-to-face contact (see Horowitz, Logsdon & Anderson, 2005, for a description). Indicative of the reciprocal nature of the interaction, however, is the inclusion of assessments of the infant's role such as the clarity of the cues given and his/her own responsiveness to the parent/mother. For practical purposes, a number of self-report questionnaires have also been developed to measure the parent-infant bond. For example, the

questionnaire developed by Condon and Corkindale (1998) identified four aspects of the mother-infant attachment from interviews with mothers and a review of the attachment literature. These four aspects are:

- *(a) Pleasure in proximity* – a desire to be close, rather than separated, from the infant
- *(b) Tolerance* – a greater willingness and ability to tolerate behaviour that might otherwise be considered irritating or frustrating
- *(c) Need-gratification and protection* – a desire to identify and meet, and give priority to, the emotional and physical needs of the infant
- *(d) Knowledge acquisition* – a desire to understand the infant and to derive a sense of competence from this understanding

An adapted form of the scale developed by Condon and Corkindale (1998) will be used in ***Growing up in Ireland*** and it will be possible to relate this assessment to the child's current functioning and later development.

4.3.3 What are the child-rearing attitudes and beliefs of Irish parents and what is their impact on their infants' social and emotional development?

All parents approach the rearing of their children with a set of beliefs and related practices that they have brought with them from their own childhood experiences or that they have acquired through other means, such as their peers, the media, reading child-rearing manuals and magazines, etc. Each country has characteristic practices and beliefs in relation to rearing children and social scientists have carefully described many of these differences between national cultures (e.g. Valsiner, 2000). Within any nation, there are often identifiable sub-cultures with their own distinct child-rearing practices. Sometimes these sub-cultures are class-based and sometimes ethnicity-based. Ireland was a very homogeneous state until very recently. The only ethnically different group in Ireland of any significant number prior to the 1990s was the Traveller community.

Okagaki and Johnson Divecha (1993) summarise the factors that have been identified as influencing parental beliefs. Outside of the home, culture, socio-economic status, work, friends and neighbours, and advice from experts can influence parental beliefs. Within the home, parental beliefs are affected by the parents' own characteristics, the marital relationship (see elsewhere in this review), and the child's characteristics (also covered elsewhere). Okagaki and Johnson Divecha also summarise the processes mediating the development of parental beliefs from these sources. These processes are the receipt of new ideas on child-rearing, be it from experts, parents or culture; whether the parents are energised or drained by the parenting role; and the characteristics that they have found important in their own occupational roles.

The level of parenting skill exhibited by a parent is likely linked to his or her level of knowledge about child development: knowing what affects development, how age-appropriate are certain activities, and so forth. Stevens (1984) found that the parenting skills (as measured by HOME – Home Observation for the Measurement of the Environment; Caldwell & Bradley, 1984) of low-income mothers of infants were positively correlated with their scores on a test of knowledge of infant development. Luster and Rhoades (1989) also found a relationship between parenting beliefs and HOME scores. They concluded that mothers who believed that: parenting influences child development; infants should be allowed to explore the environment; parents should attend to infants' cues and respond appropriately; and that young children need verbal stimulation, displayed the most supportive parenting. Benaisch and Brooks-Gunn (1996) report a positive association between maternal knowledge of child-rearing at 12 months and better child outcomes up to two years later. They suggest that the link may be mediated by a superior home environment structured by mothers with greater knowledge of child development.

The findings on the impact of parental beliefs on parental competence are mixed. In his summary of the research, Bornstein (2002) links increased self-efficacy to more competent parenting. However, Luster and Rhoades found that mothers who believed themselves to be competent actually demonstrated less

parenting skill than those who had doubts about their competence. Parents will modify their parenting in relation to the extent to which they believe they can modify their infant's behaviour, temperament, etc (Bornstein, 2002). These beliefs may be influenced by culture and by prior personal experience.

Many parenting practices vary according to culture. In ***Growing Up in Ireland*** it will be possible to identify parenting practices which are typically Irish or which are found in some Irish sub-cultures but not in others. Irish child-rearing practices are likely to have been influenced in recent years by contact with internationally dominant cultures such as the American (Greene, 1994). In a paper summarising some cross-cultural practices, Commons and Miller (1998) note that, in contrast to Kenyan mothers for example, North American mothers left babies to cry for longer; preferred early separate sleeping accommodation and the instillation of a regular sleeping pattern; were tolerant of prolonged separation from the infant (for example, going away as a couple for a weekend); and happy to leave the infant in the care of a non-familial carer. In addition, North American mothers engaged in a lot of face-to-face interaction and other stimulation of the baby whereas Kenyan mothers emphasised keeping the baby quiet and soothed. The authors suggested that the greater time spent in high arousal by North American infants, both in distress and happy excitement, results in higher levels of cortisol being released in the brain, which could have implications for stress-experience in later life.

Commons and Miller remark that Kenyan mothers became distressed while watching videos of North American mothers who resisted immediately consoling their crying infants. Comment in the media and elsewhere suggests that parents are concerned that immediately responding to an infant's cries will 'spoil' the child, or encourage the child to cry unnecessarily to get what it wants (e.g. Science Daily, 28/10/06). However, child psychologists generally advocate responding to an infant's needs in a prompt manner. According to Bornstein (2002, p.20), "parents who respond promptly, reliably, and appropriately to their babies' signals give babies a good message from the start. They tell their children that they can trust their parents to be there for them. They give their child a sense of control and self." Maternal responsiveness and sensitivity have been linked to the development of secure attachment (see earlier section in this review).

In contemporary Ireland, very little is known about current parenting practices and the diversity that exists in such practices. ***Growing Up in Ireland*** will ask parents about their parenting practices and assess the strength of the emotional bond parents express towards their infants. The differences between infants will be taken into account through an assessment of the temperament of the baby, which has a key role to play in whether the parents find their infant difficult or easy to engage with. Belsky (1984) would argue that positive parenting attitudes and skills can override the effects of an infant's difficult temperament. Such hypotheses about the relationships of parenting attitudes and practices to the baby's characteristics can be explored in the ***GUI*** study, while diverse parenting practices in the study sample can be related to later child outcomes.

Questions in the survey will permit a description of Irish parents' attitudes and practices in relation to their young infants – the first time that Irish child-rearing will be examined on a nationally representative sample. These data will permit cross-national comparisons that may be both interesting and informative.

4.3.4 How does infant temperament at nine months relate to current and future wellbeing?

As discussed in Chapter 2, temperament refers to an individual's behavioural style and characteristic way of responding to situations. Most researchers now agree that individual differences in temperament are present at birth (Santrock, 2007). For example, Novosad *et al* (1999) found that assessments of day-old babies based on sleep patterns were significantly correlated with mothers' reports of temperament at eight months. It was suggested that the newborn's characteristic way of responding to the stressful post-birth period was indicative of its individual response style.

Early observable differences in temperament suggest a biological component, possibly through variations in fundamental physiological processes. These variations could be genetically inherited from parents or through exposure to drugs, hormones or other substances in the womb. For example, Bendersky and Lewis (1998) summarise how prenatal infant exposure to cocaine has been linked to

"state lability, irregular sleep patterns, hyper-irritability, orienting and attention deficits, as well as abnormal acoustic cry characteristics" (p. 555). De Weerth, van Hees *et al* (2003) report that mothers with high cortisol levels (associated with stress) in late pregnancy were more likely to have irritable infants than mothers with low cortisol levels. In an Irish study by Nugent, Lester *et al* (1996), noisier and higher-pitched crying was associated with prenatal alcohol and cigarette use. At the other end of the spectrum, Raikonnen, Pesonen *et al* (2004) observed more positive maternal temperament ratings of infants from mothers who reported daily consumption of chocolate during the pregnancy.

Evidence for the heritability of temperament comes from twin studies indicating that identical twins are more similar than fraternal twins (e.g. meta-analysis by Goldsmith, Buss & Lemery, 1997). The apparent persistence of temperamental traits from infancy to later childhood and even adulthood supports the notion of a biological component in temperament (e.g. Kagan, Snidman & Arcus, 1993). However, such continuity may also be a result of parental reinforcement or intervention. For example, one study found that maternal-rated infant fearfulness was more strongly related to reluctance to approach peers when the child's mother was over-solicitous (Rubin, Hastings, Stewart, Henderson & Chen, 1997).

An infant's temperament influences their interactions with their parents; for example, babies who are better able to control their emotions and attention are more likely to have positive interactions with their parents (Raver, 1996); irritable infants are more likely to be perceived as difficult by their mothers, which in turn may result in less maternal involvement with the child (van den Boom, 1989). In her longitudinal study, van den Boom found that infants who were assessed as irritable as newborns were still perceived as difficult and treated as such by their mothers at six months, even though their emotionality had evened out by that age – suggesting that early interactions had an enduring impact on the mother's perceptions of the child. Keener, Zeanah *et al* (1988) report a link between individual differences in sleep patterns and perceptions of temperament. Infants aged six months who required more parent interventions to return to sleep during the night (as opposed to self-soothers), were rated by parents as having a more difficult temperament. The association was particularly strong for fathers' ratings.

Putnam, Sanson *et al* (2002) summarise a number of other examples of temperament-parenting interactions. Among 15-month-old toddlers, maternal attention-focusing was positively correlated with exploration in less active children, but negatively correlated for those children who were already active (Gandour, 1989). Interfering mothers exacerbated the incidence of aggressive behaviours among deliberately frustrated toddlers in a study by Calkins and Johnson (1998).

An infant's temperament may influence parents' investment in the child. Although parents may initially exert more energy with difficult children, this effort may decrease as the difficult child gets older, whereas it increases for easy children (e.g. Maccoby, Snow & Jacklin, 1984). Difficult children are punished more inconsistently by their parents (Lengua & Kovacs, 2005), which could have additional negative consequences for their development. In general, an easy temperament is considered to be more adaptive than a difficult temperament, which would be in keeping with Bowlby's original conception of attachment as an evolutionary function that helps to ensure the infant's survival. Adults may be more inclined to protect agreeable children in adverse circumstances, although there is an example from Ethiopia where demanding babies were more likely to be fed when food was scarce, and hence were more likely to survive (DeVries & Sameroff, 1984).

Temperament can affect the development of attachment. Putnam, Sanson *et al* (2002) summarise the attributes that have been related to later security of attachment: maternal ratings of easy temperament; sociability with strangers; orientation to people rather than objects; distress proneness and reactivity. Van den Boom (1994) found that intervention strategies aimed at mothers of irritable newborns appeared to increase the likelihood of secure attachment at one year, when compared to a control group of irritable newborns. There is also evidence that secure attachment can modify some aspects of temperament. Gunnar (1994), cited by Bee & Boyd (2007), found that inhibited toddlers with secure attachments did not demonstrate the same physiological arousal in response to new situations as inhibited toddlers with insecure attachments. It should be noted that the direction of causality is unclear in such studies.

There is some research on ethnic and cultural differences in infant temperament. In a cross-national study of the reactivity of American, Irish and Chinese infants (aged four months), Irish infants were

generally placed between the American and Chinese infants (Kagan *et al*, 1994). This pattern held for measures of *motor activity*, *fretting*, *vocalising* and *crying*, with Irish infants closer to the more active American score on all of these with the exception of crying. However, Irish infants *smiled* less often than either the American or Chinese infants (significantly so compared to the Americans). Among the Irish infants, those classified as *high-cry* (37%) had a significantly lower birth-weight than those classified as *low–cry* (63%) (Kagan, Snidman, Hendler, Greene & Nugent, 1991). It will be possible to compare the temperament of Irish infants as reported by parents in ***Growing Up in Ireland*** with that of infants studied in other countries. Such comparisons can cast light on the factors that influence temperamental differences.

4.3.5 Do Irish parents find the transition to parenthood easy or difficult and are they stressed by their parenting role?

The transition to parenthood may be smooth or difficult and can set the scene for the family environment in the early infancy of the child. In an overview of the literature on the transition to parenthood, Nyström and Őhrling (2004) found that both mothers and fathers described the experience of being a parent in the first year of the child's life as 'overwhelming'. Many couples find that there is too much to cope with, and this is combined with a fear of not knowing how to care for the child, and is often accompanied by a reduction in marital satisfaction (Cowan & Cowan, 2000).

Several factors have been identified as particularly salient in the transition to parenthood. For example, prolific work by Cowan and Cowan (1995; 2000; 2003) has pointed towards factors that include: the quality of the parental relationship before the baby arrives; whether the couple had originally agreed/disagreed on having a child or on the timing of such**;** and the occurrence of postnatal depression, all potentially leading to a sense of (dis)satisfaction in the current couple relationship. The ***Growing Up in Ireland*** study can help us to examine the manner in which parents are adjusting to parenthood and how this relates to child outcomes. There will a mix of families in the final sample; thus some will be experienced parents of one or more other children and some will be first-time parents. The differences between first-time and experienced parents will be explored.

The father's adaptation to his new role has not been as widely researched as that of the mother; although some researchers find no change in men's moods following the transition to parenthood (e.g. Belsky, Rovine & Fish, 1992), other work has found that the birth of a child has a profound effect on a man's psychological functioning, which can last for up to three years after delivery (especially of the first child) (Peitz, Kalicki & Fthenakis, 1999). This research has also highlighted three domains where decrease in satisfaction can contribute to the occurrence of depression in fathers: the marital relationship, the man's job, and his parental role. It is thought that consideration needs to be given to all three in order to fully understand adjustment to the paternal role. The arrival of a baby can also have a positive effect on parents' relationships and life-satisfaction (Belsky, 1984). While Knauth (2000) found a significant decline in both parents' satisfaction with family functioning in the transition to parenthood, Ahlborg *et al* (2005) suggested that many new parents may experience satisfaction in their emotional relationship.

The employment or unemployment of both mothers and fathers has a major impact on family life. In Ireland, increasing numbers of mothers go back to work when their children are very young, but men are still far more likely to be employed. Research in the UK shows that, prior to the arrival of children, men and women are equally likely to be in employment. However, once children arrive this situation changes quite dramatically, with 89% of men working when children are present (as opposed to 81% prior to birth) and 64% of women, as opposed to the 82% who worked prior to the birth of the child (Brewer & Paull, 2006). In the Republic of Ireland the number of mothers in paid employment has risen from 7.5% in 1971 to 46.4% in 2001 (64.7% of these from the childbearing 25–34 age-group). While having jobs has improved women's lives in many ways (and indeed this has been recognised in government 'welfare to work' policies), it is also a potential source of stress in parents' lives as they cope with rearing an infant. The literature suggests that combining work and family roles is generally conducive to men's and women's wellbeing and health, because operating in different domains gives rise to the possibility of

gaining higher economic resources, external social support and increased opportunities to develop (Barnett & Hyde, 2001; Barnett, 2004).

Issues to do with the stress of combining work and parenting a young child will be examined in the ***GUI*** study. Parental stress will be assessed by means of the Parental Stress Scale (Berry & Jones, 1995), an 18-item self-report instrument. The scale pinpoints levels of reward and satisfaction as well as stress and dissatisfaction. Scores on this scale will be related to the parents' wider context and to infant outcomes.

4.3.6 How does the quality of the parents' relationship affect the baby's wellbeing?

Research indicates a link between the parents' relationship and the quality of their parenting (Erel & Burman, 1995). As mentioned in Chapter 2, most parents in Ireland stay together during their children's childhoods, and levels of divorce and separation are low by international standards. However, a significant number of couples divorce or separate in the first five years after becoming parents – this being more common in the UK and the USA, for example (Carlson & McLanahan, 2006). Cohabitation appears to be more fragile than marriage. Data from the Millennium Cohort Study (MCS) show that, from the sample who gave birth in 2000 or 2001, married families are providing consistently more stable homes than are unmarried families. The large-scale data show that the risk of family breakdown in the first three years of a child's life was five and a half times greater for all unmarried parents (combining those who were 'cohabiting' or 'closely involved') than for married parents, three and a half times greater for those who were 'cohabiting', and 13 times greater for those describing themselves as 'closely involved' (Benson, 2006). Non-traditional family types may be both more common and more accepted in contemporary society (Kiernan & Cherlin, 1999) but it appears that the instability associated with some family forms, other than marriage, also remains high. Furthermore, Reichman *et al* (2004) showed that having a child with poor health increased the probability that the parents became less involved with each other and that they were separated by 18 months. It is likely that, in a minority of cases, the parents of the infants in ***Growing Up in Ireland*** will have separated by the time the baby is nine months old. At this age the baby will be unaware of the full implications of such a change in his or her family circumstances, although some will have formed an attachment to the parent who may now be less present in the infant's life. The longer-term impact of early parental separation will be followed up across time, depending on the number of data waves which will eventually be conducted.

The presence of conflict at this stage can affect the infant in a number of ways. For example, a conflicted relationship may inhibit the availability of one of the partners as a source of support, while infants' often subtle signals in communicating their needs may be missed if the parents are preoccupied with their own conflicted relationship. Infants may learn that they cannot rely on these caregivers as reliable sources of support; indeed, research by Parke (1995; 2002) found that, when fathers were satisfied in their marital relationships, their one-year-old infants were more likely to look to them for information in the face of stress than when the father was in a relationship where he was not satisfied. According to Shonkoff and Phillips (2000), "when caregivers can read the child's emotional cues and respond appropriately to his or her needs in a timely fashion, their interactions tend to be successful and the relationship is likely to support healthy development in multiple domains, including communication, cognition, social-emotional competence, and moral understanding".

Findings by Twenge, Campbell and Foster (2003) also suggest that postnatal marital satisfaction tends to be lower for respondents in the more recent review studies, pointing to the possibility of a link between satisfaction and the greater lifestyle choices (especially working opportunities for women) that face couples today. It is also more likely that parents who are married or cohabiting will experience less strain than single parents who are likely to face greater hurdles (such as poverty), and it is increasingly recognised that being in a stable partnership is likely to be a protective factor in making the transition to parenthood.

At its most extreme, tension between parents can result in family violence, a situation which can ultimately have very negative consequences for the children in the family (Buckley *et al*, 2006).

In ***Growing Up in Ireland*** a number of questions will attempt to assess the quality of the parents' relationship, including the Abbreviated Spanier Dyadic Adjustment Scale (Sharpley and Rogers, 1984).

4.3.7 Does father involvement improve child wellbeing?

Over recent years, psychological research has indicated that fathers' involvement in their children's lives is of great importance for the children's development (Pleck, 1997). Also, in two-parent families, emotional support from the father is associated with lower levels of maternal stress, which can enable the mother to be a better parent (Cowan & Cowan, 1992). Support from fathers is also strongly related to family structure. Married mothers report the highest levels of emotional support, compared to cohabiting mothers or those with a visiting non-resident father (Carlson, McLanahan & England, 2004; Osborne, 2004). Carlson and McLanahan (2002) also found a link between paternal support and mother-infant interaction, in that mothers who report greater emotional support from their baby's father are more likely to engage in activities with their young child, regardless of the parents' relationship status.

In a report of longitudinal work carried out by Greene, Nugent & Wieczorek-Deering (1995) using data from the Dublin Child Development Study, high levels of father involvement in infant caregiving (self-reported) were found in the sample, and mother reports of the father as the main source of support were likely to be highly associated with babies who were more securely attached. While the literature at the time of the study (late 1980s) might have suggested less involvement by fathers in a patriarchal Irish society, it will be an interesting challenge for ***Growing Up in Ireland*** to ascertain the current level of father involvement and the correlates of father involvement or lack of involvement in terms of children's development.

The correlation between fathers' participation in child-related tasks, and indicators of individual and marital satisfaction during the child's third year of life, were investigated by Peitz, Fthenakis & Kalicki (2001). They found that fathers who were highly involved in childcare, as opposed to pleasure activities, tended to express greater satisfaction in the paternal role, less feelings of disenchantment concerning their role as a father, and more enjoyment of the child. They too found that paternal involvement manifested itself in terms of a more positive opinion of their partner, while partners also tended to have fewer symptoms of exhaustion and more satisfaction in their role as a mother. This is also likely to be a function of the family type; research has shown that married couples are likely to display more commitment to one another than if they are not married (Smart & Stevens, 2000); cohabiting, rather than married couples, may also have poorer communication skills (Cohan & Kleinbaum, 2002). Father involvement can thus be, in part, a product of the parental relationship and may explain some of the different observed outcomes for children of married and unmarried parents.

In ***Growing Up in Ireland*** all fathers of the infants will be interviewed in so far as this is possible – their questionnaire is similar in most regards to that administered to mothers – and their views on their infant and their experience of fatherhood will be explored extensively. This will provide the first large data-bank on fathers and their role as parents in modern Ireland. It will also permit the analysis of associations between fathers' attitudes and behaviours and child outcomes.

4.3.8 How prevalent is parental depression and what is its impact on the child's wellbeing?

Parental psychological functioning is a very important aspect of the child's environment. The level of dependency that an infant displays on its caregiver, and the fact that the mother still tends to be the primary caregiver in the first postnatal months, makes the issue of depression occurring at this time a highly pertinent one.

In relation to the origins of postnatal depression, several risk factors have been consistently implicated in its development, and in that of depression in the early infancy period, including stressful life events, levels of social and emotional support, the quality of the partner relationship, past depression, personality vulnerability and socio-economic circumstances (Brown, Harris & Hepworth, 1994; Murphy *et al*, 1991). Epidemiological studies have shown that women are twice as likely to suffer from depression in their lifetimes as men, while a meta-analysis by O'Hara & Swain (1996) showed that 13% of women

experience depression in the postnatal period, a rate that is consistent across a variety of cultural and ethnic groups (Kumar, 1994). Greene *et al* (1991), in small Irish sample of 118 women, found that the women were as likely to be depressed in pregnancy and when their babies were 18 months old as they were to be depressed three weeks after delivery. They also cited Nott's longitudinal study (1987), which found a higher prevalence of psychiatric cases at 15 months post-partum (31%) as opposed to at three months (18.5%) and nine months (28%), with a peak incidence of new cases at nine months, indicating the need to look more closely at this issue in terms of the timing of depression and its persisting effects on the infant.

Postnatal depression is the most common form of mental illness that affects Irish mothers, with incidence reported at between 10% (McCarthy, 1998) and 15% (Eastern Health Board, 1998). Aside from concern about the mothers' wellbeing, there is an associated concern with the impact of poor maternal mental health on their child's development. This topic has been a focus of a considerable amount of research by psychologists, such as Field (1988) and Murray (2001). There is some evidence that depressed mothers react differently to their children than non-depressed mothers. For example, depressed mothers are less responsive and less positive in their interactions with their children, and this is associated with insecure attachment in their infants (Byrne, 2003).

The ***Growing Up in Ireland*** study will be able to assess levels of depression in mothers, using a brief screening measure, along with their history of depression and other mental illnesses, and relate the occurrence of depression to their infant's current and subsequent functioning.

Postnatal depression in fathers

Fathers also need to adjust during pregnancy and after childbirth. However, the effects of depression in fathers on their parenting of their infants – and older children – is not well understood (Meadows, McLanahan & Brooks-Gunn, 2005). Deater-Deckard, Pickering, Dunn, Golding & The Avon Longitudinal Study of Pregnancy and Childhood Study Team (1998) highlighted this issue to good effect in their comparison of literature reviews on depression among women (O'Hara *et al*, 1996), and their male partners (Ballard & Davies, 1996) during the postpartum period. The former included nearly 13,000 women in numerous community and clinical samples, compared to a handful of studies on men that altogether included just 466 respondents. In work to date, a high prevalence of depressive symptoms has been found among partners of depressed women, similar to those for women.

Paternal psychopathology negatively affects child wellbeing (Ramchandani *et al*, 2005). In their nine-month-old sample, Paulson *et al* (2006) highlighted that postpartum depression is a significant issue for fathers as well as mothers (10% of fathers as opposed to 14% of mothers were depressed), and found that depressive symptoms in fathers were negatively associated with positive enrichment activity with the child (reading, singing songs, and telling stories), as they were for the mother.

While few studies have looked at the buffering effects of a psychologically healthy parent (when another is not) some work undertaken recently points to the protective effect of a psychologically healthy father when the mother is psychologically unhealthy (e.g. Kahn, Brandt & Whitaker, 2004). Because the ***Growing Up in Ireland*** study will assess both parents in terms of their psychological health, it offers a good opportunity to add to the research in this area.

4.3.9 What is the effect of out-of-home childcare on the infant's social, emotional and behavioural wellbeing?

The type, timing and duration of early childcare can have a significant impact on cognitive, linguistic, socio-emotional and behavioural development, and infant health. The reasons why infants are placed in non-parental childcare can be many and various. A major reason for an infant being placed in regular non-parental care is the return to work of the mother. Employment rates were very high in Ireland in the Celtic Tiger era (in 2006 it was just 4.2%) (Central Statistics Office, 2007b), but unemployment has risen dramatically since 2008. With the economic downturn and associated loss of jobs and cuts in salary, many parents are struggling to afford childcare.

A report on the Economics of Childcare in Ireland by Goodbody Economic Consultants (1998) states that the most significant barrier to female participation is the cost of childcare and its interaction with the income-tax system as it affects women. The decision to return to work will be influenced by the expected net gain from work, which in turn is highly influenced by the cost of childcare.

A rather complex interaction develops whereby the likelihood that a child experiences non-parental care is influenced by the mother's decision to return to work. This decision is influenced by the opportunities in the labour market, but then again whether or not it is feasible for the mother to return to work depends on the cost of childcare. There are multiple possible outcomes depending on each family's circumstances at the time: as well as a choice between working full-time or staying at home full-time, a mother may return to work part-time, or become self-employed so that she can work from home, or avail of childcare provided by an unpaid relative (as many do).

While Ireland may be just catching up with countries such as the UK and USA in terms of greater female employment and need for suitable childcare, concerns about the impact of non-maternal (or more recently non-parental) care have been generating research in these and other countries for many years. It was once believed that only full-time mothers could provide infants with the care they needed in order to thrive. These beliefs were fostered by literature on the adverse effects of maternal deprivation (Bowlby, 1951). Since the 1960s, however, some social critics have argued that high-quality non-parental infant childcare is possible and that healthy emotional attachment of the infant to his or her parents appears to depend not only on the quantity of time that parents spend with their infants, but on the quality of parents' interactions with them (Lamb, 1998). The early years are undeniably important in the child's long-term development and it is therefore important to consider the impact of childcare on cognitive socio-emotional/behavioural development. As will become evident in the following review, however, the findings are notoriously inconsistent and there is a wide range of confounding variables that need to be considered when trying to draw links between childcare and outcomes. These difficulties underline the need to consider the impact of early childcare within the Irish context, and also the need for contemporary data.

The research on childcare often focuses on centre-based care compared to parental care. In Ireland, individuals in home-based settings also provide care. Often these are relatives of the child, who are frequently unpaid. In addition, there is a large network of paid childminders who might provide care in their own home or the child's home. There is further variability in the type of care provided by centres: those that are mainly baby-minding facilities and those with some kind of educational ethos such as Montessori. Some centres, called Naoinraí, provide care through the Irish language.

Findings about the effect of early childcare on social, emotional and behavioural development areas and those relating to cognition are very mixed. One might expect that placing a child in care with other children would encourage the development of good peer relations; infants become more aware of themselves and others as individuals at around 12–18 months. As with other outcomes of childcare, however, much depends on the quality of the care situation, the child's relationship with parents and care-providers, and the child's own temperament (see Lamb & Ahnert, 2006 for a review).

Some studies have indicated that, while centre-based care has generally positive outcomes on cognitive development, the socio-behavioural outcomes are often negative. For example, the (British) Effective Provision of Pre-School Education (EPPE) project found an association between early entrance to group-care (before age two years) and increased problems with behaviour at ages three and five (Sylva, Melhuish, Sammons, Siraj-Blatchford & Taggart, 2004). Yet the complexity of making links between early childcare and later behaviour are evident in the different conclusions on the impact of early childcare reached by different studies using NICHD data but different statistical controls; one found a link, the other did not (Lamb & Ahnert, 2006, citing studies by Baydar & Brooks-Gunn, 1991 and Ketterlinus, Henderson & Lamb, 1992). There is also a problem of selection effects; for example, parents who have infants with a difficult temperament may seek to place the child in centre-based care earlier than if the infant had an easy temperament.

A small study (n = 166) undertaken in Northern Ireland in the 1980s found that children in centre-based care at age nine months showed less orientation to other people's mood, and more negative mood when

assessed at age 18 months than those in parental or other home-based care (Melhuish, 1987). These infants also showed less pleasure when approached by a female stranger and most concern when briefly separated from their mothers. Recent data from the (American) Early Childhood Longitudinal Study (ECLS) indicate that centre-based care has a negative effect on socio-behavioural measures relative to parental care (Loeb *et al*, 2007). The negative effect was greater for children entering care at a younger age, and for those who spent more than 30 hours per week there. Again, however, there were variations according to family background; children from low-income families showed no negative effect of longer hours on behaviour, whereas the behaviour of children of higher-income families got worse the longer they spent in centre-based care each week. Similarly, white children showed negative effects of centre-based care that were not shared by African-American or Hispanic children. Bacharach and Baumeister (2003) used the ECLS data to look at links between different types of early care and *severe* externalising behaviour. They concluded that there were no significant differences between parental, non-relative and centre-based care in the relative risk of developing severe behaviour problems. The apparent increase in risk for children attending Head Start centres or relative care was accounted for by selection factors.

Perhaps the most concern regarding the effect of early childcare has focused on infants' attachments to their mothers. In her review of studies on this topic, Scott (1996) found that a number of studies reported an increased risk of insecure attachment for infants who spend prolonged periods in non-parental care (more than 20 hours per week). One study, which compared the age at which children entered childcare, found that prolonged periods of care had a detrimental effect only on children who had entered care before the age of 12 months (Vaughn, Gove & Egeland, 1980). However, Scott also discusses a meta-analysis that included unpublished, non-significant results to avoid the positive publication bias and failed to find any significant relationship between poorer attachment quality and maternal employment/non-parental care (Roggman, Langlois, Hubbs-Tait & Rieser-Danner, 1994). An expert committee assembled by the US Department of Health and Human Sciences to discuss the issue of attachment concluded that most babies develop secure attachments even when the mother returns to full-time work in the first six months (Colin, 1991).

The pre-school years, clearly, are important for social, emotional and behavioural development. ***Growing Up in Ireland*** will be able to provide information on the effects of having spent time in childcare and of different care arrangements, both cross-sectionally and longitudinally. However, there is a limit to what ***Growing Up in Ireland*** will be able to assess. A critical issue in relation to childcare is the quality of the care that the child experiences.

4.3.10 How do the occupational status and working conditions of mothers affect the infant's emotional and behavioural wellbeing?

The literature suggests that combining work and family roles is generally conducive to men's and women's wellbeing and health, because operating in different domains gives rise to the possibility of gaining higher economic resources, external social support and increased opportunities to develop (Barnett & Hyde; Barnett, 2004). It is also well documented that the wellbeing of the mother and father has an impact on the outcomes for the child. There is, however, a common belief that children of dual-earner couples enjoy less time, attention and commitment from their parents. This has been disputed by some of the empirical evidence (e.g. Galinsky, 1999). Although a mother's employment can cause changes in the routines and patterns of interaction with her child, the effects on infant development depend on *how* mothers allocate their time.

In a review of the literature on the effects of maternal employment on children (particularly in low-income families), Zaslow and Emig (1997) reported positive results for child development, including physical measures such as height and weight and also language skills, but noted that full-time work was associated with better outcomes than part-time work. Specifically in the case of lower-income families, this finding might be an indication that the benefits arising from increased income outweigh those associated with increased constraints on the mother's time. Moore and Driscoll (1996) also examined the effects of mother's work on child development outcomes using AFDC (back to work support for welfare recipients) recipients in the National Longitudinal Survey of Youth (NLSY) in the USA. They found

generally positive results, including decreased behavioural problems and increased maths scores in certain sub-groups, although it should be noted that the women in the study had voluntarily moved from welfare to work. In the UK, Joshi and Verropoulou (2000) found that maternal employment may increase family income, improving stability and thus child outcomes. Nevertheless, some negative effects of maternal employment on child development have been found, and seem to focus on maternal employment, particularly in the first year of a child's life. These include lower reading ability later in life (Joshi & Verropoulou, 2000; Gregg, Washbrook, Propper & Burgess, 2005) and lower educational attainment in early adulthood (Ermisch & Francesconi, 2001; Ermisch & Francesconi, 2002). It can prove difficult, however, to disentangle the effects of maternal employment *per se* from the effects of placing the infant into some form of childcare.

Any consideration of the impact of maternal employment on child outcomes must also include information on the specific work arrangements within that employment. More recent focus has turned to the actual quality of the work experience for parents, and the bi-directional influence between this and family life, including the division of household and caregiving duties. Researchers have begun to understand that "[t]he problem isn't that mothers (and fathers) work: It is how [they] work" (Galinsky, 1999), p. xiv). Recent research in Ireland, while indicating no increasing work-life tensions among the employed over the period 1996 to 2003, showed on further analysis that, when job characteristics and other factors are controlled, work-family tension is higher among those with young children and among women (O'Connell & Russell, 2005).

In a review by Poocock (2001), long parental working hours, whether for the woman or her partner, were found to be bad for children and women. Cultural norms and practices have, however, been generally slow to respond to the rise in dual-earner families (Barnett & Rivers, 1996); in many workplaces, practices continue to be structured around an assumption that paid employees have a full-time adult at home who takes care of all unpaid labour. Until recently, there was little family flexibility in the Irish workplace (Mahon, 1998). However, the increasing participation of women in the Irish workforce has been accompanied by increasing demands for childcare, flexible working and equality in this domain (Fine-Davis, Fagnani, Giovaninni, Hojgaard & Clarke, 2004). Nevertheless, the challenge of alleviating what is generally recognised as a double burden for women of labour-force employment and domestic duties remains (Russell, O'Connell & McGinnity, 2007).

Growing Up in Ireland will describe the employment status of the parents and examine their job satisfaction, level of work-family strains and gains, whether or not they benefit from family-friendly work practices, etc. The effect of the parents' working arrangements and their work-life balance on child outcomes will be analysed.

4.3.11 What factors are associated with infants' level of cognitive development at nine months?

Infancy is an important period in terms of the child's cognitive development since this is the time when the child is developing language and an understanding of basic concepts such as object constancy and cause-effect relationships. As discussed in Chapter Two, it coincides with a very important period of brain development, which may be associated with a heightened capacity to learn.

The assessment of intellectual ability in infancy is a vexed area. Most researchers agree that precise measurement of intelligence is not possible at this early stage. Assessments of infant functioning, such as the Bayley Scales of Infant and Toddler Development, do not well predict later IQ (Bayley, 2005; Colombo, 1993). They do, however, serve to identify most of those children who are cognitively impaired. In the main, quantitative study of the Infant Cohort of ***Growing Up in Ireland***, cognitive functioning will be assessed by means of the Ages and Stages Questionnaire (ASQ) (Bricker & Squires, 1999). Thus, for the purposes of the ***GUI*** study, cognitive development includes: verbalisations and language production, use and comprehension; memory; conceptual understanding; and problem-solving. All of these skills should be evident at some level in the repertoire of the infants. The ASQ sub-scales relevant to these domains are: communication and problem-solving. (The other three sub-scales are: gross motor, fine motor and personal-social.)

As with health and social-emotional development, positive cognitive development is the outcome of many interacting factors. First, the child's genetic and constitutional make-up is important. There has been a longstanding debate over the relative contribution of biology and environment to intellectual ability. Contemporary researchers see intellectual ability as the product of both genetic and environmental factors. Brain development in both the prenatal and postnatal periods is critically important for adequate intellectual functioning, but appears to be compromised only by severe malnutrition and psychological deprivation (McGregor, 1995). In Ireland, unlike in majority world countries, children are not starving and are not incarcerated in institutions, deprived of proper care and attention. However, some children live in poverty and others are subject to inadequate care and stimulation. It is important to observe the effects of these contextual variations on children's cognitive development.

Parents can play a key role in infant learning through supporting the infant's natural curiosity and active engagement with the material and social world. They also have a key role in encouraging children's language development. It has been shown that parents who talk more to their infants and talk in a varied and engaged manner have infants who are more advanced in their vocabulary acquisition (Hoff & Naigles, 2002). Parents usually adopt a speech style labelled 'motherese' or 'parentese' when talking to infants. They use shorter sentences with marked intonation and longer gaps between words (Newport, 1977).

Parents are the main 'teachers' of young infants and it is clear that there are differences between parents in the extent to which they support their children's efforts to gain understanding of their worlds. There is a limit to how deeply ***Growing Up in Ireland*** can explore the early learning environment of the infants, so maternal education will be a key proxy for maternal educational support. The relationship between both parents' education and current economic and work positions and child cognitive development will be examined, primarily using the children's level of performance on the ASQ as the key outcome variable.

The effects of out-of-home care on cognitive development have been debated for decades. In general, the research suggests that centre-based care leads to better cognitive and language outcomes than home-based care (Lamb & Ahnert, 2006). This was the conclusion of the National Institute of Child Health and Development Early Child Care Research Network (2000) in the USA, and is supported to some extent by recent findings of the Early Childhood Longitudinal Study, also in the USA (Loeb, Bridges, Bassok, Fuller & Rumberger, 2007). This latter study found that children who attended centre-based care achieved higher reading and maths scores at kindergarten, although these gains were affected by intensity of care (hours per week), age at which centre-care started and family/ethnic background. For example, the optimal age for cognitive and language development was entrance to care at 2–3 years of age, and more hours per week were associated with increased cognitive growth. This particular trend varied somewhat depending on ethnicity. Not all studies have supported the merits of centre-based care for cognitive development, however. A meta-analysis of 59 studies by Erel, Oberman and Yirmiya (2000) failed to find a reliable difference between the cognitive abilities of children with or without non-parental childcare; however, Lamb and Ahnert (2006) comment that European studies tend to be more consistent in finding positive effects of early childcare.

As might be expected, the quality of the care provided could be more important than the type of care *per se*. At first glance, centre-based care would seem to have more potential for supporting cognitive development, through providing a richer learning environment, trained staff and greater opportunity for language and play interaction with peers. This may be the case where the quality of childcare is high but it cannot be guaranteed. Unfortunately not all childcare settings provide optimal care and support (Duignan & Walsh, 2004). Legislation in Ireland focuses more on the material conditions of crèches than on the quality of the care received by the infant. Individual interaction between adult and the pre-linguistic child is essential for the development of language and communication skills, so staff in an under-staffed crèche may have less time to spend with an individual child than a parent or other home-based childminder. Centre-based care provision is better when staff-child ratios are lower and when staff are better trained (e.g. National Institute of Child Health and Human Development Early Child Care Research Network, 2002). Similarly, more highly educated home-based carers provide richer learning environments and better care (Clarke-Stewart, Vandell, Burchinal, O'Brien & McCartney, 2002).

As with many other aspects of child development, it is likely that the impact of any form of parental or non-parental care will be influenced by a number of variables. For example, good-quality centre- or home-based care may be a protective factor for infants whose homes provide a poor learning environment (Hayes, 2008), whereas poor or mediocre childcare might be detrimental to an infant whose home provides a richer environment than the care facility. In general, studies find that children from disadvantaged backgrounds benefit from centre-based care more consistently than children from advantaged backgrounds (see Lamb & Ahnert, 2006 for a review). In addition, recent data from the ECLS suggest that children from low-income families showed extra benefits from attending centres for more than 30 hours per week; these benefits were not seen in children from higher-income families (Loeb *et al*, 2007).

4.4 Summary

Some of the questions discussed above will be explored in ***Growing Up in Ireland.*** Many of the issues identified interconnect and, in the lives of children, it is important to see their development holistically, rather than in fragments categorised as cognitive development, health, behaviour, etc. It is also important to see how the different layers of their world interconnect.

In keeping with the ***GUI*** study's use of Bronfenbrenner's bioecological model of the child's ecology, Bronfenbrenner's "five critical processes for positive development" provide a good summary of what children need (1990). They read as follows:

> **Proposition 1**. In order to develop – intellectually, emotionally, socially, and morally – a child requires participation in progressively more complex reciprocal activity, on a regular basis over an extended period in the child's life, with one or more persons with whom the child develops a strong, mutual, irrational, emotional attachment and who is committed to the child's well-being and development, preferably for life.
>
> **Proposition 2**. The establishment of patterns of progressive interpersonal interaction under conditions of strong mutual attachment enhances the young child's responsiveness to other features of the immediate physical, social, and – in due course – symbolic environment that invite exploration, manipulation, elaboration and imagination. Such activities, in turn, also accelerate the child's psychological growth.
>
> **Proposition 3**. The establishment and maintenance of patterns of progressively more complex interaction and emotional attachment between caregiver and child depend in substantial degree on the availability and involvement of another adult, a *third party* who assists, encourages, spells off, gives status to, and expresses admiration and affection for the person caring for and engaging in joint activity with the child.
>
> **Proposition 4**. The effective functioning of child-rearing processes in the family and other child settings requires establishing ongoing patterns of exchange of information, two-way communication, mutual accommodation, and mutual trust between the principal settings in which children and their parents live their lives. These settings are the home, child-care programs, the school, and the parents' place of work.
>
> **Proposition 5**. The effective functioning of child-rearing processes in the family and other child settings requires public policies and practices that provide place, time, stability, status, recognition, belief systems, customs, and actions in support of child-rearing activities not only on the part of parents, caregivers, teachers, and other professional personnel, but also

> relatives, friends, neighbours, co-workers, communities, and the major economic, social, and political institutions of the entire society.

From this and the other literature surveyed it is possible to derive many hypotheses about what supports good outcomes for children. The findings generated by ***Growing Up in Ireland*** will make a strong start in exploring these connections about and on behalf of all children in Ireland.

Chapter 5

SOME CURRENT POLICY ISSUES RELEVANT TO INFANTS GROWING UP IN IRELAND

CHAPTER 5: SOME CURRENT POLICY ISSUES RELEVANT TO INFANTS GROWING UP IN IRELAND

5.1 The utility of the *Growing Up in Ireland* Infant Cohort data

The review of the literature outlines what we know about the parameters of normal infant development at and around nine months. An attempt has also been made to delineate the importance of infancy in the life-course and how events in infancy may (and may not) have lasting consequences for the life-course of the individual. Clearly, development is a complex matter and many factors intervene to confound any attempt at prediction. However, developmental science has made considerable strides in theorising mechanisms which can explain some of what is happening in human development, and in conducting empirical research that test these theories***. Growing Up in Ireland*** will contribute to the international literature on child development and childhood research.

It is also important to connect research to children's lives and to provide information that is of use to policy-makers and practitioners in Ireland as they attempt to improve children's quality of life and life chances. In Ireland, a number of issues bearing on the life experience of infants can be informed by the kind of data collected in ***Growing Up in Ireland***, both the cross-sectional data generated by Wave One of the Infant Cohort and the longitudinal data to be collected later. The value of the infant data will be immeasurably strengthened if the study is prolonged past year three.

5.2 Some policy-relevant questions

What follows is a brief list of some of the policy-relevant questions that are addressed in the ***Growing Up in Ireland*** Infant Cohort questionnaires, completed by the primary carer and, where applicable, the child's other parent (or other adult *in loco parentis),* the non-resident parent and the person who cares for the child for eight or more hours a week. Some of the questions will be answered once the data from this wave are analysed. Some will have to wait until later data waves are completed or until the comparisons between the two cohorts can be made. In the following list, questions elaborated at length in Chapters 3 and 4 are supplemented with additional questions giving some idea of the scope of the questionnaires. The questions are selected because they have a bearing on issues of concern or of interest to those who work with or on behalf of children and families. The list is in no way exhaustive. New policy concerns arise all the time and old ones subside or are resolved.

Health

1. How many – and which – mothers breastfeed their babies and is breastfeeding associated with better infant health?
2. How healthy are nine-month-olds in Ireland?
3. How many – and which – children have chronic illnesses or disabilities?
4. How satisfied are their parents with access to services? And how is this related to children's outcomes?

Infant wellbeing

1. How well are infants in Ireland developing according to standard methods of assessment (all primary carers will be asked to complete the Ages and Stages Questionnaire)?
2. How many – and which – infants are failing to reach developmental milestones?
3. Is problematic development related to social class or other family circumstances?
4. Are Irish parents finding child-rearing stressful or enjoyable? Which parents? How does parental stress influence child outcomes?

Childcare

1. Who is using out-of-home childcare and why?
2. What are the barriers to using regulated out-of-home care?
3. What are the qualifications and experiences of the people providing day care?

4. How satisfied are parents with the care their children are receiving?
5. Are babies in out-of-home care faring well and what is the relationship between hours spent in care, quality of care and the baby's wellbeing and development?
6. How do babies differ in their current functioning according to their mode of care?
7. Do mothers (and fathers) who work in the home feel less stressed or more stressed? Does their wellbeing relate to infant outcomes?
8. What are parents' future intentions for childcare?
9. Does time spent in day care at nine months predict better or worse outcomes at age three? At school entry?

Parental leave policies

1. How does maternal employment in the first year relate to child outcomes?
2. Does returning to work in the first six months, nine months or whenever the mother returns, relate to child outcomes? For which mothers?
3. Is part-time working associated with better infant outcomes? For whom?
4. How do results from the Nine-Year Cohort (when leave was shorter) compare with results from the Infant Cohort?
5. Should paternal leave be extended?
6. Should the state support parents of infants to stay at home with their children for the first year or 18 months?

Family structure

1. How many children are living in non-traditional families?
2. Is growing up in different family structures associated with any particular pattern of outcomes?
3. How does parental separation affect young children?

Families in need

1. How many families are finding it difficult to make ends meet? How does this affect infants?
2. How many infants are living in relative or consistent poverty?
3. What are the infant outcomes associated with poverty?
4. What supports are families relying upon?
5. What are the levels of parental stress?
6. Do relatively well-off families experience problems caused by affluence?

A number of cross-cutting issues can also be identified such as: Can children be identified who are experiencing multiple adversities? Who are these children and how do they fare over time? Can data collected in ***GUI*** be used to identify children at serious risk in early infancy with a view to the provision of early intervention programmes?

The data lend themselves to multi-level, multivariate analysis whereby multiple possible independent variables can be examined together to identify the strongest predictors of any specified outcome.

5.3 Conclusion

The Infant Cohort of ***Growing Up in Ireland*** will provide important information on children in Ireland as they start their journey through life. The survey will collect information from multiple informants on all the main child outcomes and on a wide range of potential influences on and determinants of the children's development and wellbeing. The data relate to prenatal, perinatal and pre-nine months' experiences as well as to the current functioning of the infant and many aspects of his or her current context. Questions have been asked about parental intentions and expectations for their infants. All these data will permit a comprehensive understanding of the status of the 11,000 infants surveyed and some of the early influences on their development. At the next data wave when the children are three years old, it will be possible to delineate those early indicators that predict later positive or negative outcomes.

It is important to appreciate that there are limitations to what ***Growing Up in Ireland*** can offer. Some of the data are retrospective, relying on parental memory and affected by biases. In one 90-minute visit there is an obvious restriction on the amount of information that can be collected. There are many more questions that the Study Team might have wanted to ask, should time and the tolerance of our participants have allowed. It is hoped that researchers will see the findings of ***Growing Up in Ireland*** as a stimulus to more and more detailed research. Nonetheless, the data as they stand will provide much-needed and invaluable new information, geared to addressing real issues confronting Irish parents, practitioners and policy-makers, and providing a strong baseline for following the infants to their third birthdays.

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