

## Section 2

### A focus on the determinants of learning and development

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## Understanding learning and development for individuals and communities

There are many factors which influence the learning and development of individuals and contribute to effective, inclusive communities. Knowledge of these factors has shaped the ways we deliver services to children, young people, families and communities, and the nature of our preschool programs, schools and adult re-entry colleges, universities and training centres, childcare, welfare agencies, workplaces and health care services.

For over fifty years, the work of Bowlby, Gesell, Piaget, Bronfenbrenner and others has provided important insights into human development by identifying the critical events occurring in infancy and childhood, including parent-child attachment, emotional regulation, and language acquisition <sup>(1,2)</sup>. Much of this knowledge focuses upon the idea of consecutive stages of development in an individual, each building upon the former, with competencies being established in a hierarchical fashion over time. Learning and development pathways, from infancy to adulthood, have been described for language, cognitive, socio-emotional, moral and the physical domains of learning, growth and development <sup>(3)</sup>.

However, there is a growing body of new research about the determinants of human learning and development. In particular, knowledge from a range of disciplines about the impact of early learning experiences on brain and behavioural development is proving influential in Australia, and internationally.

It is now evident that there is a critical inter-relationship between children's brain development and biology, and their early learning experiences and environments <sup>(4,5)</sup>. The physical, social, emotional, cognitive, behavioural and language development of a child is integrally connected to that child's life experiences and environment. How a child learns and develops across each domain influences wellbeing and competence for life; and the 'nurturing' qualities of the environments where children grow, learn and live - parents, caregivers, family and community - have the most significant impacts on their development <sup>(6)</sup>.

However, our ability to apply this knowledge has been constrained by a number of transformations in the social and economic circumstances under which families with children are living <sup>(7,8)</sup>. Over the last two decades, there have been marked changes in the nature and amount of employment engaged in by parents of children, and greater challenges in balancing work and family responsibilities; rapid technological change with implications for skills development and employment requirements; significant economic hardship for many families

despite overall increases in rates of adult employment; growing numbers of young children spending time in childcare settings, starting in infancy; a greater awareness of the effects of stress on children and young people as a result of serious family problems and the presence of adverse environmental conditions that are detrimental to their wellbeing; and the persistence of significant disparities in developmental, health and learning outcomes across the population, especially for Aboriginal peoples and others who are socially and economically disadvantaged <sup>(9)</sup>.

Parents and other caregivers cannot provide strong, nurturing environments without knowledge and support from their wider families, kinship and cultural groups, and local communities, and resources from regional, state and national arenas. Ultimately, the social and economic milieu exerts a powerful influence upon these environments, which, in turn, strongly affect learning, school success, economic participation, social citizenry, and wellbeing and development throughout life <sup>(10,11)</sup>.

In the light of new knowledge and changing social circumstances, there is a need to assess differences in learning and development across the population which can be avoided. Where effective means of preventing poor outcomes have been developed, then they are almost certainly more cost effective than attempts to ameliorate problems once they are established. The proven effectiveness of many programs suggests there is much that can be done to strengthen opportunities for those who are socially and economically disadvantaged to participate more fully in society, by focusing on policies that promote human flourishing <sup>(12)</sup>.

### Core concepts of human development

The use of the term 'development' throughout the atlas refers to human development, learning and capability - giving people the opportunities to live lives they value, and enabling them to become effective actors in their own destinies <sup>(13)</sup>. A capability approach to learning 'focuses on the ability of human beings to lead lives they have reason to value and to enhance the substantive choices they have' <sup>(13)</sup>.

The idea of human capabilities is a more expansive notion than human capital, because learning encourages aspects of human flourishing that are wider than those associated with merely increasing productivity or economic growth, and underpins what makes a 'good society' <sup>(14)</sup>. The capability approach emphasises what kinds of learning are valuable, and is particularly concerned with inequalities and developing capabilities through education. It does not dismiss human capital concerns about the economy, skills and growth but seeks to add to these, a wider remit for education and social justice <sup>(14)</sup>.

As knowledge from different disciplines has evolved and been integrated with lessons from program evaluation and practice experience, a number of core concepts have emerged that enhance our understanding of human development, learning and capability.

- Human learning and development are shaped by a dynamic and continuous interaction between biology and experience from birth; and human relationships are the building blocks of healthy development.
- Culture influences every aspect of learning and development and is reflected in child-rearing beliefs and practices designed to promote healthy adaptation and survival within the culture.
- Children are active participants in their own learning and development, reflecting the intrinsic human drive to explore and master one's environment. The growth of identity, cognitive ability, physical and emotional regulation and self-control are central to childhood learning and development.
- Development and learning unfold along individual pathways, whose trajectories are shaped by the ongoing interplay between sources of vulnerability, competence and resilience.
- The timing of early learning experiences is important, but the developing individual remains vulnerable to risks and open to protective influences throughout the early years of life and into adolescence and adulthood.
- The course of learning and development can be altered in childhood by effective interventions, thereby shifting the odds in favour of more adaptive outcomes <sup>(8)</sup>.

In summary, humans are born ready to learn and develop. Early environments are vital, but are not deterministic, and nurturing relationships remain essential for human learning and development throughout life.

### ***New knowledge about brain development***

The brain is the major organ of learning, and neuroscience, the study of the brain, has the potential to make important contributions to educational research, policy and practice <sup>(15, 16)</sup>. These could include new understandings of the biological and environmental processes that underpin learning through life; the discovery of neural markers for educational risk; and the evaluation of debates in education that have not been resolved on the basis of behavioural data, by showing how the brain actually learns what is being taught <sup>(17)</sup>. However, all of these contributions are still to emerge.

In work undertaken for the World Health Organization's *Commission into the Social Determinants of Health*, some of the main findings from this new brain research are summarised; and they apply universally to early brain development, irrespective of the society and a child and family's place within that society <sup>(11)</sup>.

- The early years of life are marked by the most rapid development, especially of the brain and other parts of the central nervous system.
- There are a number of sensitive or 'critical' periods in the development of the human brain that occur almost exclusively during this time. For each of these critical periods, specific regions (and therefore specific functions) of the brain undergo essential growth and formation.
- The environments of the infant and child determine the learning experiences which shape or 'sculpt' the networks and patterns within the developing brain <sup>(18)</sup>. The more nurturing the physical, social, and economic environments of children during these early years, the greater the chances for their successful growth and development.
- The brain development occurring during this time provides many of the essential building blocks across many domains, including economic, social, cognitive and physical wellbeing. Although individuals continue to develop and learn beyond their childhoods, the environmental conditions to which children are exposed in the early years of development can have consequences for the rest of their lives <sup>(19, 20)</sup>.
- The pervasive socioeconomic differences, or 'inequalities', in adult learning outcomes (and many other markers of wellbeing) have their roots in socioeconomic inequalities in early development. That is, during the earliest years of life, differences in the extent of benefit provided by children's environmental conditions lead to differences in early developmental outcomes; and the effects of these early inequalities translate into inequalities in learning, development and wellbeing in later childhood, adolescence, and adulthood <sup>(20)</sup>.

Therefore, infancy and childhood represent sensitive periods in brain development. By the time that children begin school, they have already developed key communication, learning and thinking skills; learned to build and maintain relationships; and formed a strong sense of their own identity <sup>(139)</sup>. By middle childhood, a child's brain development and functioning have been profoundly shaped by the nature of earlier learning and experiences. However, emerging research findings indicate that the crucial

brain developments in the first years of childhood now extend well into middle childhood, and beyond.

There are at least two aspects of brain development of particular interest in the period of middle childhood (up to the end of primary school). The first is that brain synapses (connections between cells in the nervous system) that are initially present as children enter this developmental phase may be gradually eliminated if they are not used. A pattern of *synaptogenesis*, or the creation and fine-tuning of brain synapses in the human cerebral cortex during early childhood, is followed by a gradual pruning process of unused connections, which eventually reduces the overall number of synapses to their adult levels. These waves of intense branching and connecting, followed by a reduction in neurons through pruning, occur before birth through to about the age of 3 years, and again at the age of 11 or 12 years<sup>(22)</sup>.

Synaptic pruning brings an improvement in the speed of information processing and a greater ability to undertake complex problem-solving<sup>(21)</sup>. However, the loss of synapses also explains why it is more difficult for an adult to learn a new language without a foreign accent, or to become a concert pianist, without having first acquired a degree of skill before puberty<sup>(23)</sup>. For example, the areas of the brain that specialise in language grow rapidly until about the age of thirteen and then stop, with no further enlargement.

The second finding from research is that the regions of the brain appear to develop according to different time lines. Children grow cognitively at different rates and may not achieve the same stage at the same time. Thus, it is difficult and may even be unhelpful to limit interventions up to a specified biological age<sup>(24)</sup>. Variations in brain development and functioning also appear to play a critical role in learning abilities and disabilities as well as patterns of behaviour<sup>(25)</sup>. During middle childhood, identification and potential diagnosis of special needs, including issues such as Attention Deficit Hyperactivity Disorder and autism spectrum disorders, typically peak. Gender or sex-based differences in brain functioning and, possibly learning styles, also become apparent; and there is evidence that boys are at higher risk than girls for poor literacy performance, special education placement, and school drop-out<sup>(26)</sup>.

In early adolescence, further development of brain structure and function takes place, and there are effects from hormonal influences<sup>(27)</sup>. During this time, behaviour and emotion are less adequately controlled due to a lack of synchrony between the development of the areas for novelty and sensation-seeking (both of which increase dramatically at puberty), and the development of self-regulatory competence<sup>(28)</sup>. As a result, young people are more likely to engage in risky behaviours, and to be

impulsive and react emotionally. At these ages, the brain tends to learn best when appropriately challenged in an environment that encourages taking risks, but where it is not subjected to high levels of stress or of negative emotional reactions<sup>(23)</sup>. The frontal lobes of the brain, which are responsible for high-level reasoning and decision-making, do not fully mature until early adulthood, after the age of 20 years<sup>(29)</sup>.

Despite this, many adolescents are able to get along with their parents and teachers most of the time, complete their schooling, have positive relationships with peers, do not become addicted to drugs or alcohol, and emerge as productive and competent adults<sup>(30)</sup>. However, there is also evidence that a significant proportion of adolescents experience great stress, struggle, and emotional turmoil<sup>(31, 32)</sup>.

While our brains show the greatest degree of plasticity during the early years of childhood, a certain level of flexibility and adaptability remains throughout life. The structure of the brain at any time is a product of interactions between inherited and environmental factors, including both the outside environment and the internal physiological milieu. Stresses placed on the developing individual, by a mismatch between existing capacities and demands placed by the environment, results in compensatory physiological responses and behaviours that, in time, may affect brain structures. This can be part of a normal learning process, or, if the mismatch is too severe, can result in pathology<sup>(33)</sup>.

Between the microscopic components of the brain and the elements of psychology lie the means by which familial and educational experiences also intersect with developmental biology to shape our cognitive abilities, learning capacities, behaviours and wellbeing<sup>(34)</sup>. All of these are patterned by the social and economic influences on the nature of the experiences which shape learning and development. In other words, 'one's experience become embedded in one's biology'<sup>(35)</sup>. This interactive process is highly complex and yet to be fully described.

As outlined above, neuroscientific findings can help to delineate underlying developmental processes in ways that can inform more effective interventions and social policies to promote better learning and development across the population. However, we now know that complex cognitive, behavioural and social factors are so intertwined with biological development as to make simplistic goals unhelpful. An understanding of brain development does not imply any diminished role for the social, cultural, and familial influences on these developing biological systems. Rather, it emphasises how an understanding of biological processes can enhance the importance of learning or social policy interventions<sup>(23)</sup>.

As the socioeconomic environment is a key determinant of early development, in turn, early development is a determinant of learning and wellbeing across the rest of life <sup>(11)</sup>. This new research offers the most robust evidence for understanding (and therefore, acting upon) the social and economic determinants of development, learning and wellbeing at an individual, and a population level <sup>(11)</sup>.

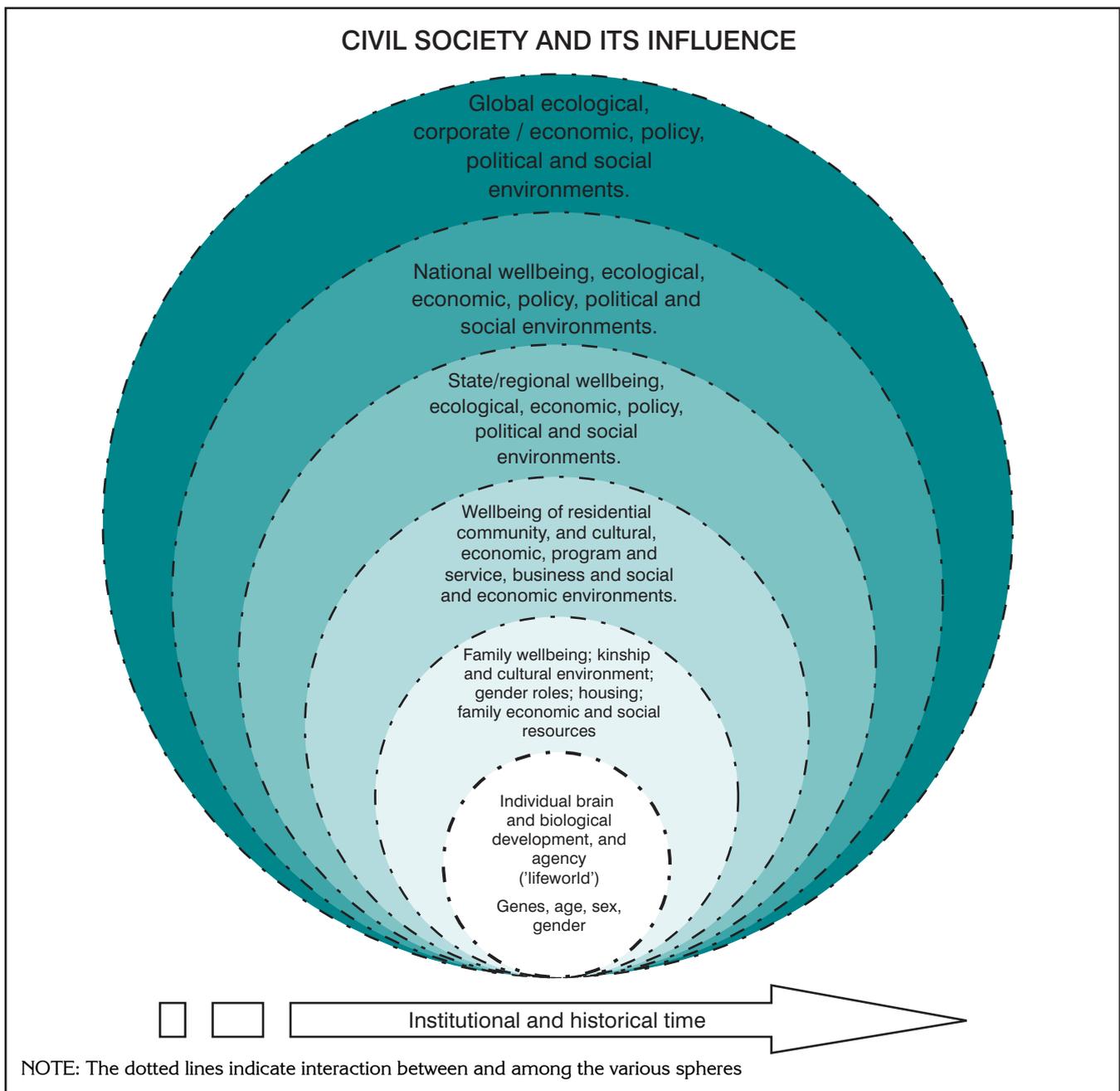
### What factors determine our learning and development across the life span?

While there are many theoretical models which aim to describe the determinants of learning and development, each has its limitations because of the

difficulty in accurately depicting the complex web of interactions, which are known to contribute to outcomes in learning and development over the life course. There is also much that is still to be understood about the multiple influences on learning and development and their significance. However, models can be useful by simplifying the myriad of different factors and explaining what we know of their relationships to each other.

The model used in this report (Figure 1) draws on the work of Siddiqi and colleagues (2007) on early childhood learning and development, and that of a number of leading authors of bio-ecological development and population health models <sup>(36, 37, 38)</sup>.

**Figure 1: The key influences on learning and development across the life span (adapted from Bronfenbrenner 1986; Dahlgren & Whitehead 1991; Siddiqi et al. 2007; Kelly et al. 2009)**



Interacting and interdependent environmental 'spheres of influence' are used to illustrate those factors which are universally important in providing enriching experiences and determining learning and development outcomes from conception, through early childhood and into adulthood<sup>(11)</sup>. These influences also operate according to the nature of the culture and/or society in which they occur.

The environments are not strictly hierarchical, but overlap, interact and interconnect, and represent social as well as physical and geographical milieus<sup>(11)</sup>. The developing individual lies at the centre. At the most intimate level is the family environment, which includes extended family and kinship groups who are children's first and most important educators<sup>(139)</sup>. At the next level are residential communities (such as local neighbourhoods), 'relational' communities (such as those based on religious, cultural or other social bonds), and the program and services' environment, which includes early childhood programs, childcare, schools, training centres and adult educational institutions, as well as other key services such as health, welfare and housing<sup>(11)</sup>.

Each of these environments is situated in a broader socioeconomic context that is shaped by factors at the regional, national, and global levels<sup>(10)</sup>. Each can be described according to the physical, social, cultural, and economic aspects, which seek to optimise learning and development, and maximise the equity of enriching learning experiences. Underlying the framework is the role played by civil society groups that may act at every level (i.e. on every sphere of influence), and traverse all environments<sup>(11)</sup>.

All of these influences are time-related, both in terms of a person's life course and in the changes that occur over time in the policies, knowledge, research, institutions and structures that affect learning and development positively and negatively<sup>(10)</sup>. The path that leads to a particular outcome may be very different for different individuals and populations; for example, children achieve learning and development outcomes in many ways, and at varying rates and times. The timing and sequence of biological, cognitive, psychological, emotional, cultural and historical events and experiences all influence the development, learning and wellbeing of both individuals and populations.

### **1. Influences at the level of the individual**

At the most fundamental level, learning and development are the result of the interplay between the environment and an individual's inherent predispositions (e.g., genes, gender, temperament and so forth), both before and after birth. We are now discovering that, far from being purely deterministic, the activation of genetic information is

stimulated by environmental influences, which affect the ways in which genes are expressed during life<sup>(39)</sup>.

From conception and through pregnancy, many biological and physical factors influence the developing fetus before birth, with lifelong effects on learning and development. Maternal nutrition, *in utero* exposure to tobacco, alcohol and other substances, infective agents, physical growth, and maternal exposure to toxic stress and violence are all significant.

Nutrition from the mother provides the essential building blocks for intra-uterine growth, and deficiencies transmitted to the fetus can impair learning and development. For example, a diet that is very poor in fatty acids and iodine will not be able to provide the fetus with the elements essential for physical and brain development, resulting in reduced visual function, behavioural abnormalities, cognitive, intellectual and other disabilities<sup>(40, 41, 42)</sup>. In fact, nutritional deficiencies at all stages of childhood can have long-term damaging effects on intellectual, physical and psychological development<sup>(41, 11)</sup>.

Intra-uterine growth restriction leading to a low birth weight can affect postnatal health and neurological development in childhood and later life<sup>(43)</sup>. Very low birth weight infants born prematurely are at higher risk for developing cognitive, neuromotor and neurosensory disabilities, including blindness and hearing loss. These disabilities in turn may lead to other deficits in speech, language and learning and behaviour problems affecting later school performance<sup>(44)</sup>.

During the first year of life, breastfeeding plays an important role in infant nutrition, and is associated with healthier physical, brain and social development, and increased resistance to infection. It also encourages attachment and bonding to the mother, another requirement for optimal child development and learning<sup>(45)</sup>.

While genetic predisposition and biological characteristics at the individual level partly explain how environment and experience shape early learning and development, other research highlights the significance of regulatory and control systems for competent individuals<sup>(46)</sup>. For example, emotion regulation, cognition, attachment and emotional security, and internal thought processing and appraisal systems are anchored in the developing brain and its operation. Environmental influences, particularly the quality of the interpersonal relationships experienced in infancy and early childhood, can both foster and hinder the development of these systems, which are essential for competent emotional, social and cognitive functioning<sup>(35, 47)</sup>.

The relationships children have with their caregivers play critical roles in regulating stress hormone

production during the early years of life<sup>(33)</sup>. Parents and other caregivers help to modulate emotional arousal by attending to an infant's needs. Inhibitory biological mechanisms also develop to influence the way children adapt positively to stressful situations. These include diminished stress hormone release in response to stress, and less neuronal loss in the relevant area of the brain as children age<sup>(48)</sup>. The appropriate development of emotion regulation predicts better social and cognitive competence and behaviour; and self-regulation in childhood affects coping strategies in adolescence and adulthood<sup>(49)</sup>.

Attachment, the formation of secure relationships, is another area which has long-term implications for learning and developmental pathways<sup>(50, 51)</sup>. The young child is a social agent who shapes, and is in turn shaped by the environment<sup>(10, 38)</sup>. Secure attachment to a trusted caregiver, with consistent caring, support and affection early in life, provides a basis for a child to learn about her or his environment, and to become competent and self-confident<sup>(52)</sup>. Secure attachments in early childhood are central to emotional wellbeing, and predict fewer behaviour problems and healthier relationships in childhood, adolescence and adulthood<sup>(53, 54)</sup>.

Mechanisms involved in cognitive processing are a further area of development which is critical for longer term adjustment and behaviour. Young children integrate their observations and experiences into internal working models of human interaction, cultural rules and expectations of behaviour, regarding themselves and others<sup>(55, 56)</sup>. These inner beliefs and appraisal systems (or 'lifeworld') play a large part in learning, social competence, wellbeing and functioning in later childhood, adolescence and adulthood<sup>(38)</sup>.

How a child develops across each domain influences learning, wellbeing and competence for life, and there are many avenues for these to evolve<sup>(6)</sup>. The role of play, for example, is universal to all cultures, and is essential for children's social, physical and cognitive development. Play fosters important social skills, and is an arena for learning, physical activity and the expression of children's feelings. Play processes influence synaptic formation in the brain, and are linked to secure attachments with caregivers and relationships with other children<sup>(57)</sup>. In older children, play contributes to positive peer relationships, emotional regulation and motor skill development and coordination.

Competence in these developmental domains as a result of nurturing relationships and experiences has become a better predictor of learning and wellbeing outcomes than relying solely upon the socioeconomic conditions in which children live and learn<sup>(11)</sup>. This is because many children from disadvantaged backgrounds are able to learn and develop well, despite adverse circumstances<sup>(58, 59)</sup>.

Such resilience is predicted by attributes of a child's disposition (e.g., temperament, self-belief, cognitive abilities), family characteristics (such as warmth and closeness), and the availability and use of external support systems by family members<sup>(60)</sup>. The presence of one or more of these protective factors is associated with better child and adolescent outcomes in the context of adversity<sup>(46, 61)</sup>.

The early childhood period is crucially important in developmental terms, representing untapped learning potential which, if nurtured and nourished, can transform an individual child's outcomes<sup>(62, 63)</sup>. While scientific research increases our knowledge of the child's neural pathways and critical periods for learning and development, it cannot tell us how to produce the best outcomes with certainty for all young children, because children's learning and development is complicated and influenced by many environmental factors; and children help to form their environments through their own actions<sup>(64)</sup>. Social and economic determinants shape brain and biological development through their influences on the qualities of stimulation, support, and nurturing available to the child through their families and communities, and the resources available from regional, national and global contexts<sup>(11)</sup>. These influences also remain critically important to wellbeing through adolescence and adulthood.

## 2. *The influence of family*

To become productive and competent adults, children need to live in environments that provide some order and meet their learning and development requirements, as well as their physical, emotional and material needs<sup>(1)</sup>. The immediate family environment is most often the context which first structures a child's early learning experiences with others. Public discussion often focuses heavily on the form of family, but what matters for children is how family members interact and are able to meet their children's fundamental needs. Critical to the family environment are its social and economic resources<sup>(10)</sup>.

A family's social resources include parenting skills and education, cultural practices and approaches, the health of family members and the nature of intra-familial relationships. Responsiveness, cohesion, organisation, consistency, warmth and safety are all essential qualities of a family that will promote optimal learning and development for a child<sup>(65, 46)</sup>.

Families are also responsible for mediating a child's exposure to the wider community, and for the degree to which a child is appropriately protected from negative influences. Research findings about children who manage to thrive in spite of adversity indicate the critical importance of a consistent, caring adult who is able to engage the child in an

ongoing relationship <sup>(59)</sup>. Other studies show that children require adults in their immediate environment who are capable of instilling a positive sense of responsibility and passing on social and moral expectations <sup>(4)</sup>. In addition to sound relationships with adults in their communities, children need freedom from discrimination, opportunities to build self-reliance and confidence, and a sense of justice in their world <sup>(59)</sup>.

Looking at the function of families leads to the question of whether a family is supported or hindered to fulfil its roles and responsibilities. To be the good parents that most want and hope to be, adults also need meaningful employment and learning opportunities. To ensure wellbeing for all family members, there must be adequate health care, housing, safety, transport and access to quality childcare. For optimal child development and learning, families need support from neighbours, schools, community agencies and governments, and opportunities to develop relationships and pursue their interests <sup>(66)</sup>.

A lack of any of these resources decreases a family's ability to fulfil its purpose. Without adequate income, the likelihood of having good health, safe housing, education, satisfying work or other life expectations diminishes substantially <sup>(7)</sup>. Family economic circumstances may also determine the ability to access high quality childcare and other programs which can enhance children's learning and development. The resulting tension increases the likelihood of instability and stress in relationships among family members, further decreasing the family's ability to maintain a supportive environment for the development of its children <sup>(67)</sup>.

The effect of differences in the social and economic resources of families is the most powerful explanation for inequalities in children's learning and development across societies; and these resources profoundly affect all other aspects of the family environment <sup>(10)</sup>. The association between socioeconomic status and a wide range of outcomes over the life span is consistently strong in population-based research across many different fields, including learning and development. For example, there is a demonstrated association between socioeconomic circumstances and language and cognitive development in young children, largely based on the richness of the language environment available to the child <sup>(68)</sup>. Family socioeconomic status also has an association with other outcomes for children such as low birthweight, risk of child abuse and neglect, poorer cognitive test scores, risk of disengagement from school, difficulties with behaviour and socialisation, and adult education, health and employment <sup>(69, 47)</sup>.

### **3. The influence of relational communities, residential communities, and programs and services**

#### **3.1 Relational communities**

Children's learning and development are also shaped by the nature of the relational communities (social ties to those with a common identity) which surround their families <sup>(10)</sup>. Relational communities help to form an individual's social identity, which is a critical factor for wellbeing over the lifespan. It may be based on tribal, ethnic, religious, spiritual, language and cultural attributes <sup>(10)</sup>. Relational communities are a primary support for many families, and are often the means by which child-rearing practices and information about child learning and development are transmitted across generations <sup>(10)</sup>. As such, they influence how children identify themselves and others, help build self-worth and a sense of belonging, and can be a source of social inclusion, and also of exclusion <sup>(70)</sup>.

Membership of such a community may engender discrimination, racism, and other forms of injustice from an intolerant wider society, with deleterious consequences for learning, development and wellbeing in the short and longer terms <sup>(71)</sup>.

#### **3.2 Residential communities**

Learning and development of children and young people are also influenced by the nature of the residential communities where they and their families live. These communities can benefit families in many different ways - from services that assist with parenting and other roles, to support networks which offer learning opportunities and build social cohesion – all of which are important for child and family wellbeing <sup>(67, 72)</sup>. Volunteer programs, play groups, non-government agencies, service organisations, small businesses and governments provide many necessary services to families at a local community level.

Key to maintaining the wellbeing of a community are available resources to support learning and development, starting before birth, followed by coordinated, comprehensive, local services to deal with the small and large crises that inevitably occur in the normal life of any family <sup>(11)</sup>. These resources may come from outside the community itself, from the larger system of institutions created to provide support for all families, and services when children or families need them <sup>(10)</sup>. However, differences remain in the extent to which families' needs are being met, and may be seen in the inequalities in the learning and developmental attributes of their members.

The socioeconomic environment of residential communities can be described in many ways: for example, by the average or median income level, the

proportion of jobless families with children or those who are dependent on income support, or the percentage of people who have completed Year 12, or its equivalent, of secondary school <sup>(73)</sup>. Research has shown that more advantaged neighbourhoods are associated with better disposition to learn and school achievement (including verbal and reading ability) in their children and adolescents <sup>(74, 75)</sup>. These effects may operate indirectly via parental behaviour, quality of the home environment and family functioning; and are also influenced by attributes of the neighbourhood such as its collective efficacy, developmental health, and demographic, ethnic and economic diversity <sup>(76, 77)</sup>.

As children reach school age, their interactions and experiences within various contexts such as school, peers and the neighbourhood increase and exert more structured influences on learning. For example, in a Canadian study, children from poor families living in economically mixed neighbourhoods appeared to do better in assessments of their learning ability (i.e., maths and verbal achievement) than similar children living in uniformly disadvantaged neighbourhoods <sup>(78)</sup>. Behaviour problem scores were higher when children lived in neighbourhoods with low cohesion, fewer affluent residents and high unemployment rates, after controlling for family socioeconomic factors <sup>(78)</sup>. Children's sense of self and belonging in their environment are integral to their social and emotional development, and help them develop a stronger connection to their community <sup>(79)</sup>.

Children's learning and development are also directly influenced by physical aspects of their residential communities. The socioeconomic status of a community is inversely associated with the risk of exposure to pollutants, poor air and water quality, excessive noise, residential crowding and other hazards for children's learning and development <sup>(80)</sup>. Restricted space, polluted soils and unsafe environments may reduce opportunities for play, physical activity and other forms of recreation, and social and emotional development can also be hampered in communities marked by high levels of interpersonal violence and trauma. Many Aboriginal children living in remote communities have experienced unacceptably high levels of exposure to all or some of these hazards, with consequences for their learning and development <sup>(81)</sup>.

### 3.3 Programs and services

There is a wide range of services and programs which influence learning and development across the life span. Many of these sit within the education sector, but health, welfare, local government, community, business and a myriad of other sectors also contribute.

Early child development programs are an effective way to address avoidable inequalities in learning and development across a population <sup>(82)</sup>. There is good evidence that investment in effective programs that enhance all aspects of children's learning and development – physical, emotional, cognitive, language, social, cultural, spiritual – will reap benefits many times over for children, families, communities and nations, if they start early and are continued throughout childhood <sup>(63, 83, 115)</sup>. Quality programs have been shown to foster and promote human capital, that is, individuals' competence and skills for participating in society and the work force as adults <sup>(84)</sup>. Programs which also link to preventive health services and incorporate health-promoting measures, are more likely to bring sustained improvements in physical, social, emotional, language and cognitive development as well as reducing the future burden of disease and poor health, especially for those who are the most disadvantaged <sup>(82, 85)</sup>.

The quality and appropriateness of these programs and services is critical to achieving good outcomes, especially for children from disadvantaged families <sup>(86, 87)</sup>. Principles for sustainable programs include cultural sensitivity and appropriateness; community ownership; a common purpose and consensus about outcomes related to the needs of the community; partnerships among community and service providers, parents and caregivers; enhanced community capacity through active involvement of families and other stakeholders; and an appropriate management plan (including users) which facilitates the monitoring of quality and evaluation of effectiveness <sup>(10, 88)</sup>.

Successful programs build on existing resources and local networks, and create and maintain collaborative relationships with parents, elders and cultural leaders, other family caregivers and older siblings <sup>(89)</sup>. Programs should be universally offered, but tailored to the specific needs of children and their families, such as for Aboriginal families, children with disabilities or those who are recent arrivals as refugees. Programs can include parent education, play and parent support groups, in-home support with early stimulation and care, community-based childcare, and health and community development programs, intensively offered according to need. To be effective, programs must converge at the level of the family and the local community in a way that puts children and their interests at their centre <sup>(10)</sup>.

Research on targeted early childhood programs in the USA has consistently shown short-term cognitive improvements as well as long-term gains in terms of academic achievement and reduction in special education placement, employment, earnings and crime <sup>(2, 92)</sup>. Parents also received positive benefits in

terms of maternal employment and increased parental involvement in their child's school<sup>(90, 91, 93)</sup>. In the UK, research has also demonstrated positive long-lasting effects from early education on cognitive skills in adolescence, and on the likelihood of obtaining qualifications and to be employed at the age of 33 years<sup>(94)</sup>.

By the time that children start school, they are already proficient learners who bring into their new learning environment, knowledge about the world and their interactions within it. They also may reflect the different experiences and the impact of social and economic disparities of their family and community in their skill sets and behaviours<sup>(95, 96)</sup>.

The process of learning and development that occurs within the school system is complex, and outcomes for students may be attributed to many different factors. Much research has been undertaken to elucidate the impacts of its numerous dimensions (teacher attributes, class size, curricula, institutional milieu, disciplinary approaches, philosophy and so forth) on individual students of all ages who are the recipients. All children bring with them both vulnerabilities and strengths. The role of the education system is to create contexts that address the vulnerabilities and enrich competence and support further learning and development of all its students<sup>(97)</sup>.

There are a wide range of factors that influence school outcomes for students, from the relatively stable influences of family background, school sector, type and size of school, to the more dynamic or contextual influences of leadership, school organisation (related to curriculum, teacher development and school climate) and student characteristics (related to students' self-concept, mobility, attitudes to school, learning and involvement)<sup>(98)</sup>.

The impact of socioeconomic disadvantage on student achievement is substantial, as risk factors for adverse outcomes often occur together, and can have cumulative effects over time on children's learning and development<sup>(99)</sup>. Ongoing family adversity is a risk factor for attention difficulties, poor cognitive performance, delinquency, and greater absenteeism from school due to ill health<sup>(100, 101)</sup>. The cumulative effect of familial stressors such as low income, poor parental education, young maternal age at birth, large family size and family instability can have a pervasive effect on the wellbeing of children and young people at school<sup>(67, 102)</sup>. However, it is also apparent that for any characteristic or group of characteristics predicting low achievement, some children possessing them will achieve at higher levels than those risks alone might predict.

There are socioeconomic differences evident in student learning outcomes as measured by indicators such as scores in literacy, numeracy and reading ability tests, and in rates of school completion and engagement, and entry into post-school qualifications<sup>(103, 104)</sup>. Determining the relative importance of what a student brings to the task, the curricula, education policy, the principal, the school climate, peers, the teacher, the various teaching strategies, the family and the home environment is challenging<sup>(105)</sup>. There is much debate in the research literature about whether the differences, on average, in the achievement levels of disadvantaged and privileged students are more a function of the quality of schooling they receive; background characteristics (family, community, social, and economic) that influence achievement after controlling for instructional quality; or school quality and background characteristics acting together; and the size of the contribution of each<sup>(106, 107)</sup>.

In Australia, it has been estimated that the largest differences in performance are related to differences between individual students (about 80%) rather than differences between schools (about 20%)<sup>(108)</sup>. A review of research into factors explaining differences in performance between students and schools showed consistent and large effects of factors such as socioeconomic status, ethnicity, gender or school type that were not easily influenced<sup>(108)</sup>. However, factors between students that can be affected included self-efficacy, aspirations, interest, and homework effort. Between schools, emphasis on academic achievement, homework policies and some resource variables (e.g. specialised science facility, library) tended to explain differences in performance<sup>(108)</sup>.

Teaching is a powerful influence on learning outcomes. When all other sources of variation are taken into account, including gender, social backgrounds of students and differences between schools, the largest differences in student achievement are between classes, and the most important source of the variation is teacher quality<sup>(108, 109)</sup>. Other research has suggested the teacher is responsible for an estimated 30% of the variance in student achievement, highlighting excellence in teaching and 'expert teachers' as another important focus of attention<sup>(110, 111)</sup>.

It is also evident that the ways in which systems such as education, health, housing and welfare are delivered and structured can increase existing inequality. For example, schooling can be a way of addressing inequality and also a way of reproducing it. It has been suggested that there are two goals for a social justice program in education: to work to eliminate the contribution that the education system makes to the production over time of social inequality in general; and to maximise the positive

contributions that the education system makes to reducing social inequality<sup>(112)</sup>.

Explaining differences in achievement between students within schools and between schools is important for determining the level at which resources should be allocated, in order to maximise their effect on improving learning outcomes for students; that is, whether it is more effective to direct resources to schools, their staff and infrastructure or to students and their families<sup>(108)</sup>. Research suggests that strategies to improve disadvantaged children's performance will be more effective if they combine school improvement efforts with policies to narrow social and economic inequalities<sup>(106)</sup>. In Australia, educational programs have been designed to ameliorate the effects of socioeconomic disadvantage using both whole-school approaches and individualised remedial interventions<sup>(113)</sup>. Further research is required to examine whether student achievement would be improved more through programs that target schools with high concentrations of students from lower socioeconomic groups than those that distribute resources to individual students, regardless of the schools they attend<sup>(113)</sup>.

Learning is marked by a series of developmental stages and transitions between stages. Successful completion of the learning and developmental tasks at each stage is dependent upon successful completion of tasks at previous stages<sup>(114)</sup>. While early childhood is an important period, pathways are not immutable and transitions occur throughout life. It is important to intervene early in a pathway, not only early in life; and to intervene at times of transition, when an individual is open to learning new things that are relevant to achieving the transition<sup>(115, 116, 117)</sup>. Supports for learning and development and safety nets are needed throughout the life course.

#### **4. The influence of regional, state, national and global environments**

An ecological understanding of the relationship of children to their families and families to their communities is incomplete without recognising the important influence of regional, state and national agencies, policies and practices. The impact of these environments is fundamental in determining the quality and accessibility of services and resources to families and communities. They are also important to understanding where inequalities in opportunity and outcome exist and the levels of society at which restorative action can be implemented<sup>(10)</sup>.

Changing environments at the state or national level can influence outcomes across multiple determinants of learning and development for far larger numbers of children and their families, through wealth creation and redistribution,

employment, public investment in social support services (such as education, early childhood, welfare, disability and health), child- and family-friendly policies, income safety nets, legislation and the protection of children's rights<sup>(10)</sup>.

The global environment is, increasingly, a powerful influence on national economic and social outcomes, and ultimately, on a nation's citizens<sup>(11)</sup>. It is also characterised by important international conventions such as the United Nations' *Convention on the Rights of the Child*, which offer opportunities to gauge a nation's efforts with respect to the learning, development and wellbeing of its children. In this regard, civil society groups also play a pivotal role. When civil society is enabled, there are many ways in which advocates for children, young people and families can work to improve the life outcomes of those who are disadvantaged, both within a country and internationally<sup>(11)</sup>.

#### **Linking aspects of wellbeing, learning and development across the life span**

Human learning and development are inextricably related to wellbeing at an individual, family, community and population level, and these influences interact and change with time and stage of life. Increasingly, there is interest in ways in which individuals can acquire new skills, capacities and knowledge throughout life, with learning and development being seen as lifelong pursuits that are also associated with adult wellbeing<sup>(118)</sup>.

Early childhood learning provides the base for learning throughout life, and family and neighbourhood influences at this time are particularly significant. As discussed, there is considerable evidence that factors such as income, housing, parenting and trauma impact on children's learning. However, not all children in low income households will experience negative outcomes: the impact of income can be moderated by the effect of other protective factors, such as parents' education, cultural knowledge, relationship with a mentor, or access to other social resources. What matters is the configuration of circumstances experienced by the child and family, and how the child responds. In this regard, high-quality programs during the early years are critical, because of their role in supporting the development of competencies and the capacity to engage effectively in learning throughout life<sup>(119, 120)</sup>.

'Learning through life' plays an important role in delivering a wide range of benefits, both for the individual, their families and communities, and for society as a whole<sup>(118)</sup>. Such benefits are diverse in nature, and provide substantial and lasting outcomes. These positive effects of learning can be generally described as good functioning and wellbeing, but the meaning of this varies, according

to the level at which the benefits are realised <sup>(121)</sup>. For individuals, economic benefits include improved earning and employment prospects and social mobility, and, at a state and national level, contribution to economic growth, equality of opportunity and a 'good society'.

Lifelong learning has also been linked to other aspects of individual and collective wellbeing, such as physical and mental health, reduction in criminal behaviour, and the promotion of social cohesion and tolerance <sup>(122, 123)</sup>. Through the strengthening of self-identity, learning helps individuals to develop a sense of direction and to take greater responsibility for their life choices, and to contribute to the social and cultural spheres in which they live <sup>(124, 125)</sup>. Programs that build in 'learning to be, growth in wellbeing and self-awareness' as a desired outcome, recognise the influence that learning has on personal and social identity <sup>(126)</sup>. In an ageing community, successful participation in adult learning is important not only in enabling workers to adapt and adjust to the rapidly changing requirements of their jobs, but also in helping older people lead active and satisfying lives <sup>(121)</sup>.

Critical to lifelong learning is an individual's disposition to learn, which also has consequences for families, communities, businesses, society and the wider economy. The disposition to learn is influenced by experiences early in life, at school, access to technology and life events at the personal level, and more broadly, by the contexts within which people live and work <sup>(121)</sup>. Low skill and educational attainment, unemployment and inadequate income are associated with very low participation in lifelong learning, and also with poorer wellbeing <sup>(127)</sup>. Relativities in income influence people's sense of identity and where they sit in the social hierarchy; low self-image can lead to health inequalities through stress, risk-taking, low health literacy and poorer wellbeing, as well as to criminal and anti-social behaviour, disengagement from learning and social exclusion <sup>(128, 129)</sup>.

Research shows that the learning trajectory an individual takes may be predicted on the basis of characteristics (age, sex, family background, initial schooling, early adult life factors and present circumstances) which are largely known by school-leaving age <sup>(130)</sup>. People still make choices, and life crises can intervene, but these also occur within a framework of opportunities, influences and expectations that are socially patterned. Other evidence confirms the stability of economic, practical and psychological constraints to learning, and their substantial role in maintaining intergenerational patterns of inequality <sup>(121)</sup>.

While Australia has reasonable patterns of participation in adult education and training when compared internationally, considerable

socioeconomic differences across the population exist. Those who are unemployed or not in the labour force, have low incomes and low educational attainment at school are less likely to participate in adult learning <sup>(131)</sup>. Social and economic contexts are powerful in moderating the effects of learning and development in adults, but indicate areas for attention by policy makers <sup>(122)</sup>. Socioeconomic inequalities in educational access and attainment need to be addressed, both to improve social cohesion and to broaden and deepen the range of capabilities and innovation within the population <sup>(121)</sup>.

## Addressing avoidable differences in learning and development outcomes

Overall, levels of learning, development and wellbeing of the South Australian population are high when compared to the populations of many overseas countries.

However, there are substantial differences in learning, development and wellbeing of specific groups within our population. For example, compared with other South Australians, Aboriginal peoples are disadvantaged across a broad range of social and economic factors, including education, employment, income, health and housing. This is the result of many underlying causes, including the intergenerational effects of forced separations from family, land and culture, and the lasting impacts of colonisation and discrimination. This has placed them at greater risk of poorer life outcomes compared to the non-Aboriginal population <sup>(81)</sup>.

These and other disparities are referred to as 'inequalities', reflecting the fact that such differences exist. The notion of 'inequality' implies a sense of two things being different, not the same. Numerous inequalities exist across the population and they tend to divide the community into different groupings.

There are many types of inequality – age, sex, ethnicity, social and economic position, disability, geographical area, remoteness, and so on. Some dimensions of inequality are unavoidable and not amenable to change, such as age. Other inequalities occur as a result of differences in access to learning opportunities, material resources, safe working conditions, effective services, living conditions in childhood, the experience of racism and discrimination, and so on. Such inequalities can also alter expectations of what life offers in the future.

Many inequalities are potentially avoidable and therefore, the fact that they occur implies a degree of unfairness, or inequity. Such inequities occur as a consequence of unjustifiable differences in opportunity, which result in unequal access to those

resources and influences that will optimise learning and development and overall wellbeing <sup>(132)</sup>.

### *The impact of social and economic inequalities*

Economic inequality is evident in the uneven distribution of wealth in society. It implies an unequal distribution of the ability to purchase 'goods' such as housing, education, recreation, health care and other resources, and the choice to do so <sup>(133)</sup>.

Social inequality is the expression of the lack of access to these opportunities and represents a degree of exclusion of people from full and equal participation in what we believe is worthwhile, valued and socially desirable <sup>(133)</sup>.

Thus, economic and social inequalities are inevitably linked, and their combined impact results in limited opportunities and life chances for many who are affected by them <sup>(134)</sup>. Such inequalities tend to stratify the community into hierarchies, with those who have the most resources, opportunities and power to choose, at the top; and those with increasingly less, in layers below them. The effect of these hierarchies is to entrench differences in wellbeing across the population.

As discussed earlier, learning and development are not simply the result of genetic inheritance and environmental influences on each person. They are as much a population phenomenon as a purely individual one <sup>(5)</sup>. For example, there is a strong association between the wellbeing of a population and the size of the social difference between members of the population. This has come to be known as the 'gradient effect' <sup>(135)</sup>. In societies that have sharp social and economic differences between individuals in the population, the overall level of wellbeing is lower than in societies where these differences are less pronounced <sup>(136)</sup>.

Furthermore, this gradient effect exists for a wide range of learning and developmental outcomes – from behavioural adjustment and social skills, literacy and reading ability, to mathematics achievement and participation in adult learning <sup>(135)</sup>. The gradient effect also seems to hold equally well whether one looks at differences in current socioeconomic position or in that of the family of origin. These effects appear to persist, from birth, through childhood and into adulthood and old age <sup>(5)</sup>. Evidence is now linking these findings together, one on individual brain development, learning and behaviour and the other on life span gradient effects in the wellbeing of populations. Most significant is the finding that for all areas of learning and development, steep gradients are associated with overall poorer outcomes <sup>(5)</sup>.

Thus, the underlying factors that determine learning and development are deeply embedded in social circumstances <sup>(7)</sup>. These patterns of population gradients, especially their longitudinal nature, suggest a potentially important role for early learning experience in shaping coping skills, resiliency and the neuro-biologic responses at the individual level, which can then show up later as population effects <sup>(5)</sup>. It also strengthens the role of effective services and early programs in learning and development and their intervention across the life span.

Inequality in learning and development is a matter for significant community concern because it tends to unravel the social fabric of society, through its adverse effects on individuals' life chances and their ability to participate as active citizens in all areas of community life. These effects may also be handed down from generation to generation. The 'hidden damage' from social and economic inequalities shapes every aspect of life: from the ability to learn and the foundations of wellbeing laid down in childhood and adolescence, the safety of neighbourhoods and the productivity of our enterprises, to our collective identity as a community.

In summary, there is now substantial evidence that wellbeing is the result of complex interactions of the social, biological and ecological environments in which people live <sup>(137)</sup>. If these environments are supportive, they provide a foundation for the development of competence, capacity and skills that underpin learning, behaviour and wellbeing throughout life <sup>(137)</sup>. However, a lack of enabling social and environmental conditions results in poorer life outcomes for people <sup>(5)</sup>.

This situation, however, is not inevitable. There is a growing body of knowledge that can provide direction for developing policies to reduce such inequities in modern societies. The socioeconomic environment is a powerful and potentially modifiable factor and public policy is a key instrument to improve this environment, particularly in areas such as early childhood development, educational achievement, taxation and social security, work environments, urban design, housing and pollution control <sup>(138)</sup>.

Therefore, different approaches and mixes of policies and programs must be mounted to address avoidable inequalities. These approaches may include more precise targeting within a universal service framework, but also greater attention to community-based dimensions of 'interdependence' between individual behaviours, key determinants of learning and development, and community and institutional resources.

A focus on the environmental context of life in no way implies that other factors such as genetics,

individual choices or use of services do not figure in determining wellbeing, learning and development; rather, this highlights a greater understanding in recent years of the social and economic factors that underpin differences in the likelihood of having a fulfilling life. There are a number of benefits that investing in a population approach offers: increased prosperity, because a well-functioning, skilled population is a major contributor to a vibrant economy; reduced expenditures on education, health and social problems; and overall community stability and wellbeing for South Australians.

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