# Child Growth and Development Canadian Ed

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# Contents

# *Forward*

We are pleased to share the first Canadian edition of Child Growth and Development. This textbook is being published as an open educational resource (see What are Open Textbooks for more information) for students who are studying child development. Content for this textbook was adapted from Child Growth and Development (Paris, Ricardo, Rymond, and Johnson, see acknowledgement.

The Canadian context has been added to align with the College of ECEs Code of Ethics and Standards of Practice as well as the Ministry of Education the Child and Early Years Act and finally speaks to the Calls to Action published by the Truth and Reconciliation Commission.

Open educational resources allow for collaborations and improvements to textbooks on an ongoing basis rather than waiting for each subsequent edition to be released. With this in mind, we realize that this is the first Canadian edition, and edits and updates will continue to be made based on social and cultural trends, as well as changes to policy and practices for Early Childhood Educators.

# *Acknowledgement*

Since the beginning of creation, the people of Turtle Island (what others call North America) have always respected the land they live on, the water that flows through it and all living beings because those are the very things that sustain us. Indigenous people all over the world have always had a connection to our Earth Mother. Because she is Sacred. Because she gives us life.

The authors of this textbook want to remind everyone of the importance of commemorating Indigenous people's principle kinship to the land that we gather, teach and reside on.

Loyalist College would like to acknowledge that the land on which they gather is the traditional territory of the Wendat, Anishnaabeg, and Haudenosaunee Peoples and directly adjacent to the Kanien'keha:ka

Fleming College respectfully acknowledges that they are situated on Mississauga lands and the traditional territory covered by the Williams Treaties.

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**The Importance of Land Acknowledgements**

Kimmerer (2013) "To the settler mind, land was property, real estate, capital, or natural resources. But to our people, it was everything: identity, our connection to the ancestors, the home of non-human kinfolk, our pharmacy, our grocery store, our library, the source of everything that sustained us. Our lands were where our responsibility to the world was enacted, sacred ground. It belonged to itself; it was a gift, not a commodity, so it could never be bought or sold. (p. 17)"

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The elders tell us that all four colours of man have a responsibility to take care of the land because the soil that we walk on has become the earth in which their ancestors have also been laid to rest. They have now become a part of this Sacred land. We take care of it, not for ourselves but for our future generations. For our children and their children's children.

# *Attribution*

This Canadian edition of Child Growth and Development is licensed under a Creative Commons Attribution Share-Alike 4.0 International license except where otherwise noted.

Content for this textbook was adapted from Child Growth and Development (Paris, Ricardo, Rymond, and Johnson)" by Paris, Ricardo, Raymond, & Johnson, The Child Growth and Development textbook is licensed under LibreTexts is licensed under CC BY 4.0  unless otherwise noted.

References included in this textbook follow APA formatting whenever possible. References in the form of footnotes are from the original textbook.

This project is made possible with funding by the Government of Ontario and through eCampusOntario's support of the Virtual Learning Strategy. To learn more about the Virtual Learning Strategy visit: https://vls.ecampusontario.ca.

# *Terminology*

For the purpose of this textbook age groups have been defined as the following;

- Infants: 0 – 18mths
- Toddlers: 18mths – 30mths
- Preschoolers: 30mths – 5yrs
- Middle childhood: 6 – 12 yrs

The use of the word Indigenous is still just starting to get known in First Nation, Metis and Inuit (FNMI) communities. Although some communities still use the word Aboriginal, many Indigenous leaders are asking that the word Aboriginal be replaced with Indigenous. When specific studies were/are conducted or stats are used or when Indigenous people are mentioned, it is best to use either one of those words to reflect the peoples that were part of them. (i.e. A study that was conducted about Inuit people; the wording should be Inuit instead of the broader term "Indigenous".). For hundreds of years, Indigenous people were treated as "less than human". For this reason, we use a capital "I" to reflect that Indigenous people are human.

For the purpose of establishing an understanding of the importance of the spiritual domain for Indigenous people, the ancillary activities will capture spirituality in the emotional component of the textbook to reflect the worldview that individuals should be seen in a holistic way. That is that we must see the individual as a whole because all the domains that are part of the individual are interconnected. The reasoning behind this is that anything that raises the self-esteem, self-worth, and the spirit of a child or individual will enhance their spiritual development.

Indigenous people Traditions and culture know and understand the sacredness of our ways. For this reason, throughout the activities, one will note that the word tradition is seen with a capital "T". When the reader sees this, they will be reminded that the Indigenous people value their Traditions in a sacred way. When the word is seen with a lower case "t", it will reflect the common use of the word traditional.

# *What are Open Textbooks?*

An open textbook is a textbook licensed under an open copyright license, and made available online to be used freely by students, teachers, and members of the public.
Open textbooks:

- are created by educators;
- are reviewed by educators;
- contribute to successful learning outcomes.

## WHAT MAKES OPEN TEXTBOOKS DIFFERENT FROM A TRADITIONAL TEXTBOOK?

Traditionally published textbooks are produced under closed copyright, meaning they cannot be shared, re-used, or re-purposed. They are usually costly (hundreds of dollars each) with new editions published frequently, rendering texts that are only a year or two old out of date. Digital editions or e-textbooks from commercial publishers, though slightly less expensive, are sold with digital rights management software that means the books only appear on a student's e-reader for a short period of time (4-6 months), preventing them from keeping the book for future reference, or re-selling it to their fellow students.

In contrast to traditional textbooks, openly licensed textbooks give faculty the ability to use any portion of a textbook in their courses without requiring students to purchase an entire book, or to make the content of a given textbook more pedagogically appropriate for their specific educational context. The open licensing of open textbooks allows for collaborations on and improvements to textbooks from contributors around the world.

When an instructor uses an open textbook as an assigned reading, students have the option to access the digital edition for free through a website or via download to e-readers or tablets. Students can purchase a low-cost paper copy via print-on-demand services.

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# *Accessiblity Statement*

Loyalist College and Fleming College believe that education must be available to everyone; this means supporting the creation of free, open, and accessible educational resources. We are actively committed to increasing the accessibility and usability of the textbooks we produce.

## Accessibility features of the web version of this resource

The web version of Child Growth and Development Canadian Edition has been designed with accessibility in mind by incorporating the following features:
   It has been optimized for people who use screen-reader technology.
   all content can be navigated using a keyboard.
   links, headings, and tables are formatted to work with screen readers.
   All images include descriptions and alt tags.
   Information is not conveyed by colour alone.

## Other file formats available

In addition to the web version, additional files are available for downloading in a number of file formats including PDF, Digital PDF and EPUB (for eReaders).

## Known accessibility issues and areas for improvement

While we strive to ensure that this resource is as accessible and usable as possible, we might not always get it right. There are currently no known issues. We are always looking for ways to make the textbook more accessible. If you have any problems accessing content please let us know so we can fix the issue.
   Please include the following information:
   The name of the textbook
   The location of the problem by providing a web address or page description.
   A description of the problem
   You can contact us at through email cllae@loyalistcollege.com

## Accessibility standards

The web version of this resource has been designed to meet Web Content Accessibility Guidelines 2.0, level AA. In addition, it follows all guidelines in Appendix A: Checklist for Accessibility of the *Accessibility Toolkit – 2nd Edition*.

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# Introduction to Child Development

| Chapter Objectives |
| --- |

After this chapter, you should be able to:

- Describe the principles that underlie development.

- Differentiate periods of human development.

- Understand issues in development.

- Distinguish the different methods of research.

- Explain what a theory is and compare and contrast different theories of child development.

## INTRODUCTION

"Early child development sets the foundation for lifelong learning, behaviour, and health" (Mustard, 2006).

Welcome to Child Growth and Development. This text is a presentation of how and why children grow, develop, and learn from conception to adolescence. Registered early childhood educators (RECEs) draw from their professional knowledge of child development, learning theories, and pedagogical and curricular approaches to plan, implement, document and assess child-centered inquiry and play-based learning experiences for children (College of Early Childhood Educators, 2017, p. 10). Understanding the patterns of development help early childhood educators build caring and responsive relationships (College of Early Childhood Educators, 2017) with the children in their care as well as design safe and accessible environments which support children's play and learning (College of Early Childhood Educators, 2017), both of which contribute to a sense of belonging and overall well-being (Ontario Ministry of Education, 2014b).

The content in this text is being shared with pre-service early childhood educators with an Ontario context, referring to foundational documents that support the early learning and care profession, including, but not exclusive of: The Code of Ethics and Standards of Practice for Early Childhood Educators in Ontario, *How Does Learning Happen*? and Excerpts from *ELECT*.

## PRINCIPLES OF DEVELOPMENT

There are several underlying principles of development to keep in mind:

- Development is lifelong and change is apparent across the lifespan (although this text ends with

adolescence). Early experiences affect later development.

- Development is multidirectional. We show gains in some areas of development while showing a loss in other areas.
- Development is multidimensional. We change across three general domains/dimensions: physical, cognitive, and social-emotional.

In Ontario, the Continuum of Development can be found in the Excerpts to *ELECT.* It outlines the sequence of steps across the five domains of development (social, emotional, communication/language/literacy, cognition, physical) that are typical for the majority of children. It is not an assessment tool, rather it was designed to support RECEs as they observe and document children's emerging skills (Ontario Ministry of Education, 2014). It should be noted that all five domains are interrelated and no one domain is more important than another (Ontario Ministry of Education, 2014a).

Research in child development tends to fall into one of the following four themes:

- Early Development is related to later development but not perfectly. Can you think of examples?
- Development is always jointly influenced by heredity and environment (nature/nurture).
- Children help to determine their own development. Can you think of examples?
- Development in different domains is connected.

The physical domain includes changes in height and weight, changes in gross and fine motor skills, sensory capabilities, the nervous system, as well as the propensity for disease and illness.

The cognitive domain encompasses the changes in intelligence, wisdom, perception, problem-solving, memory, and language.

The social and emotional domain (also referred to as psychosocial) focuses on changes in emotion, self-perception, and interpersonal relationships with families, peers, and friends.

All three domains influence each other. It is also important to note that a change in one domain may cascade and prompt changes in the other domains.

Development is characterized by plasticity, which is our ability to change, and that many of our characteristics are malleable. *Early experiences are important, but children are remarkably resilient (able to overcome adversity).*

Development is multicontextual (Lally & Valentine-French, 2019). We are influenced by both nature (genetics) and nurture (the environment) – when and where we live and our actions, beliefs, and values are a response to circumstances surrounding us. The key here is to understand that behaviours, motivations, emotions, and choices are all part of a bigger picture (Lumen Learning, n.d.).

Now let's look at a framework for examining development.

## PERIODS OF DEVELOPMENT

Consider what periods of development you think a course on Child Development would address. How many stages are on your list? Perhaps you have three: infancy, childhood, and teenagers.

Developmentalists (those that study development) break this part of the life span into these five stages as follows:

- Prenatal Development (conception through birth)
- Infancy and Toddlerhood (birth through 30 months)
- Early Childhood  (2.5 to 5 years)
- Middle Childhood (6 to 12 years)
- Adolescence (13 years to adulthood)

The scope of practice of a registered early childhood educator in Ontario is to work with children twelve years old and younger (College of Early Childhood Educators, 2017), thus the first four stages in this list will be explored in this book. So, while both an 8-month-old and an 8-year-old are considered children, they have very different physical, social, emotional, language, and cognitive skills and abilities.

## PRENATAL DEVELOPMENT

Conception occurs and development begins. All of the major structures of the body are forming and the health of the mother is of primary concern. Understanding nutrition, teratogens (or environmental factors that can lead to birth defects), and labor and delivery are primary concerns.



*Figure 1.1: A tiny embryo (14 days) depicting some development of arms and legs, as well as facial features that are starting to show. (Image by lunar caustic is licensed under CC BY 2.0)*

## INFANCY AND TODDLERHOOD

The first two years of life are ones of dramatic growth and change. A newborn, with a keen sense of hearing but very poor vision is transformed into a walking, talking toddler within a relatively short period of time. Caregivers are also transformed from someone who manages the feeding and sleep schedules to a constantly moving guide and safety inspector for a mobile, energetic child.

*Figure 1.2: Infant lying on his belly looking at a stuffed animal  (Photo by Minnie Zhou on Unsplash)*

## EARLY CHILDHOOD

Early childhood is also referred to as the preschool years and consists of the years which follow toddlerhood and precede formal schooling (grade 1). As a three to five-year-old, the child is busy learning a language, is gaining a sense of self and greater independence and is beginning to learn the workings of the physical world. This knowledge does not come quickly, however, and preschoolers may initially have interesting conceptions of size, time, space, and distance such as fearing that they may go down the drain if they sit at the front of the bathtub or by demonstrating how long something will take by holding out their two index fingers several inches apart. A toddler's fierce determination to do something may give way to a four-year-old's sense of guilt for action that brings the disapproval of others.



*Figure 1.3: Outdoor play time (Photo by Alexandr Podvalny on Unsplash)*

## MIDDLE CHILDHOOD

The ages of six through twelve comprise middle childhood and much of what children experience at this age is connected to their involvement in the early grades of school. Now the world becomes one of learning and testing

new academic skills and of assessing one's abilities and accomplishments by making comparisons between self and others. Schools compare students and make these comparisons public through team sports, test scores, and other forms of recognition. Growth rates slow down and children are able to refine their motor skills at this point in life. Children begin to learn about social relationships beyond the family through interaction with friends and fellow students.



*Figure 1.4: Working together in a game of Tug of War*
*(Photo by Anna Samoylova on Unsplash)*

## ADOLESCENCE

Adolescence is a period of dramatic physical change marked by an overall physical growth spurt and sexual maturation, known as puberty. It is also a time of cognitive change as the adolescent begins to think of new possibilities and to consider abstract concepts such as love, fear, and freedom. Ironically, adolescents have a sense of invincibility that puts them at greater risk of dying from accidents or contracting sexually transmitted infections that can have lifelong consequences (Lumen Learning, 2019).



*Figure 1.5: Social relationships in the teenage years*
*(Photo by Priscilla Du Preez on Unsplash)*

## ISSUES IN DEVELOPMENT

There are some aspects of development that have been hotly debated. Let's explore these in a bit more detail.

## Nature and Nurture

Why are people the way they are? Are features such as height, weight, personality, being diabetic, etc. the result of heredity or environmental factors-or both? For decades, scholars have carried on the "nature/nurture" debate. For any particular feature, those on the side of Nature would argue that heredity plays the most important role in bringing about that feature. Those on the side of Nurture would argue that one's environment is most significant in shaping the way we are. This debate continues in all aspects of human development, and most scholars agree that there is a constant interplay between the two forces. It is difficult to isolate the root of any single behaviour as a result solely of nature or nurture. This said, research does consistently point to the fact that healthy child development depends on the relationships children have with parents and other important people in their lives (Bisnaire, Clinton & Ferguson, 2014).

# Continuity versus Discontinuity

Is human development best characterized as a slow, gradual process, or is it best viewed as one of more abrupt change? The answer to that question often depends on which developmental theorist you ask and what topic is being studied. The theories of Freud, Erikson, Piaget, and Kohlberg are called stage theories. Stage theories or discontinuous development assume that developmental change often occurs in distinct stages that are qualitatively different from each other, and in a set, universal sequence. At each stage of development, children and adults have different qualities and characteristics. Thus, stage theorists assume development is more discontinuous. Others, such as the behaviourists, Vygotsky, and information processing theorists, assume development is a more slow and gradual process known as continuous development. For instance, they would see the adult as not possessing new skills, but more advanced skills that were already present in some form in the child. Brain development and environmental experiences contribute to the acquisition of more developed skills.
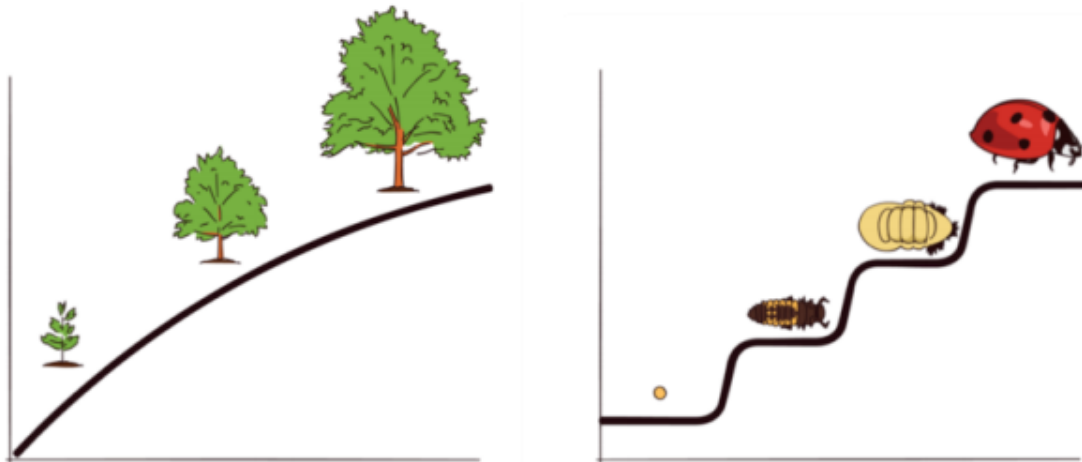


*Figure 1.6: The graph to the left shows three stages in the continuous growth of a tree. The graph to the right shows four distinct stages of development in the life cycle of a ladybug. (Image by NOBA is licensed under CC BY-NC-SA 4.0)*

## Active Vs Passive

How much do you play a role in your own developmental path? Are you at the whim of your genetic inheritance or the environment that surrounds you? Some theorists see humans as playing a much more active role in their own development. Piaget, for instance, believed that children actively explore their world and construct new ways

of thinking to explain the things they experience. In contrast, many behaviourists view humans as being more passive in the developmental process (Lally & Valentine-French, 2019).

How do we know so much about how we grow, develop, and learn? Let's look at how that data is gathered through research.

## Research Methods

An important part of learning any science is having a basic knowledge of the techniques used in gathering information. The hallmark of scientific investigation is that of following a set of procedures designed to keep questioning or skepticism alive while describing, explaining, or testing any phenomenon. Some people are hesitant to trust academicians or researchers because they may seem to change their narratives. That, however, is exactly what science is all about; it involves continuously renewing our understanding of the subjects in question and an ongoing investigation of how and why events occur. Science is a vehicle for going on a never-ending journey. In the area of development, we have seen changes in recommendations for nutrition, in explanations of psychological states as people age, and in parenting advice. So think of learning about human development as a lifelong endeavour.

Take a moment to write down two things that you know about childhood. Now, how do you know? Chances are you know these things based on your own history (experiential reality) or based on what others have told you or cultural ideas (agreement reality) (Seccombe and Warner, 2004, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). There are several problems with personal inquiry.

**Read the following sentence aloud:**
Paris in the the spring
...Are you sure that is what it said?
**Read it again:**
Paris in the the spring

If you read it differently the second time (adding the second "the") you just experienced one of the problems with personal inquiry; that is, the tendency to see what we believe. Our assumptions very often guide our perceptions, consequently, when we believe something, we tend to see it even if it is not there. This problem may just be a result of cognitive 'blinders' or it may be part of a more conscious attempt to support our own views. Confirmation bias is the tendency to look for evidence that we are right and in so doing, we ignore contradictory evidence. Karl Popper was an Austrian-British philosopher, academic and social commentator. One of the 20th century's most influential philosophers of science, Popper is known for his rejection of the classical inductivist views on the scientific method in favour of empirical falsification. He suggests that the distinction between that which is scientific and that which is unscientific is that science is falsifiable; scientific inquiry involves attempts to reject or refute a theory or set of assumptions (Thornton, 2005, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Theory that cannot be falsified is not scientific. And much of what we do in personal inquiry involves drawing conclusions based on what we have personally experienced or validating our own experience by discussing what

we think is true with others who share the same views. Science offers a more systematic way to make comparisons guard against bias.

## Scientific Methods

One method of scientific investigation involves the following steps:

1. Determining a research question
2. Reviewing previous studies addressing the topic in question (known as a literature review)
3. Determining a method of gathering information
4. Conducting the study
5. Interpreting results
6. Drawing conclusions; stating limitations of the study and suggestions for future research
7. Making your findings available to others (both to share information and to have your work scrutinized by others)

Your findings can then be used by others as they explore the area of interest and through this process, a literature or knowledge base is established. This model of scientific investigation presents research as a linear process guided by a specific research question. And it typically involves quantifying or using statistics to understand and report what has been studied. Many academic journals publish reports on studies conducted in this manner.

Another model of research referred to as qualitative research may involve steps such as these:

1. Begin with a broad area of interest
2. Gain entrance into a group to be researched
3. Gather field notes about the setting, the people, the structure, the activities, or other areas of interest
4. Ask open-ended, broad "grand tour" types of questions when interviewing subjects
5. Modify research questions as the study continues
6. Note patterns or consistencies
7. Explore new areas deemed important by the people being observed
8. Report findings

In this type of research, theoretical ideas are "grounded" in the experiences of the participants. The researcher is the student and the people in the setting are the teachers as they inform the researcher of their world (Glazer & Strauss, 1967, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Researchers are to be aware of their own biases and assumptions, acknowledge them, and bracket them in efforts to keep them from limiting accuracy in reporting. Sometimes qualitative studies are used initially to explore a topic and more quantitative studies are used to test or explain what was first described.

Let's look more closely at some techniques, or research methods used to describe, explain, or evaluate. Each of these designs has strengths and weaknesses and is sometimes used in combination with other designs within a s ingle study.

## Observational Studies

Observational studies involve watching and recording the actions of participants. This may take place in the natural setting, such as observing children at play at a park, or behind a one-
way glass while children are at play in a laboratory playroom. The researcher may follow a checklist and record the frequency and duration of events (perhaps how many conflicts occur among 2-year-olds) or may observe and record as much as possible about an event (such as observing children in a classroom and capturing the details about the room design and what the children and teachers are doing and saying). In general, observational studies have the strength of allowing the researcher to see how people behave rather than relying on self-report. What people do and what they say they do are often very different. A major weakness of observational studies is that they do not allow the researcher to explain causal relationships. Yet, observational studies are useful and widely used when studying children. Children tend to change their behaviour when they know they are being watched (known as the Hawthorne effect) and may not survey well.

## Experiments

*Experiments* are designed to test hypotheses (or specific statements about the relationship between variables) in a controlled setting in efforts to explain how certain factors or events produce outcomes. A variable is anything that changes in value. Concepts are operationalized or transformed into variables in research, which means that the researcher must specify exactly what is going to be measured in the study.

Three conditions must be met in order to establish cause and effect. Experimental designs are useful in meeting these conditions. 1. The independent and dependent variables must be related. In other words, when one is altered, the other changes in response. (The independent variable is something altered or introduced by the researcher. The dependent variable is the outcome or the factor affected by the introduction of the independent variable. For example, if we are looking at the impact of exercise on stress levels, the independent variable would be exercise; the dependent variable would be stress.) 2. The cause must come before the effect. Experiments involve measuring subjects on the dependent variable before exposing them to the independent variable (establishing a baseline). So we would measure the subjects' level of stress before introducing exercise and then again after the exercise to see if there has been a change in stress levels. (Observational and survey research does not always allow us to look at the timing of these events, which makes understanding causality problematic with these designs.) 3. The cause must be isolated. The researcher must ensure that no outside, perhaps unknown variables are actually causing the effect we see. The experimental design helps make this possible. In an experiment, we would make sure that our subjects' diets were held constant throughout the exercise program. Otherwise, the diet might really be creating a change in stress level rather than exercise.

A basic experimental design involves beginning with a sample (or subset of a population) and randomly assigning subjects to one of two groups: the experimental group or the control group. The experimental group is the group that is going to be exposed to an independent variable or condition the researcher is introducing as a potential cause of an event. The control group is going to be used for comparison and is going to have the same experience as the experimental group but will not be exposed to the independent variable. After exposing the experimental group to the independent variable, the two groups are measured again to see if a change has occurred. If so, we are in a better position to suggest that the independent variable caused the change in the dependent variable.

The major advantage of the experimental design is that of helping to establish cause and effect relationships. A disadvantage of this design is the difficulty of translating much of what happens in a laboratory setting into real life.

## Case Studies

**Case studies** involve exploring a single case or situation in great detail. Information may be gathered with the use of observation, interviews, testing, or other methods to uncover as much as possible about a person or situation. Case studies are helpful when investigating unusual situations such as brain trauma or children reared in isolation. And they are often used by clinicians who conduct case studies as part of their normal practice when gathering information about a client or patient coming in for treatment. Case studies can be used to explore areas about which little is known and can provide rich detail about situations or conditions. However, the findings from case studies cannot be generalized or applied to larger populations; this is because cases are not randomly selected and no control group is used for comparison.
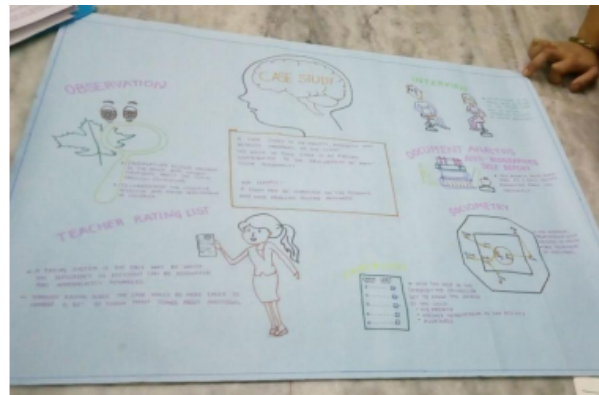


*Figure 1.7: Illustrated poster from a classroom describing a case study. (Image by Mary George licensed under CC-BY-SA 4.0)*

## Surveys

Surveys are familiar to most people because they are so widely used. Surveys enhance accessibility to subjects because they can be conducted in person, over the phone, through the mail, or online. A survey involves asking a standard set of questions to a group of subjects. In a highly structured survey, subjects are forced to choose from a response set such as "strongly disagree, disagree, undecided, agree, strongly agree"; or "0, 1-5, 6-10, etc." This is known as the Likert Scale. Surveys are commonly used by sociologists, marketing researchers, political scientists, therapists, and others to gather information on many independent and dependent variables in a relatively short period of time. Surveys typically yield surface information on a wide variety of factors, but may not allow for an in-depth understanding of human behaviour.

Of course, surveys can be designed in a number of ways. They may include forced-choice questions and semi-structured questions in which the researcher allows the respondent to describe or give details about certain events. One of the most difficult aspects of designing a good survey is wording questions in an unbiased way and asking the right questions so that respondents can give a clear response rather than choosing "undecided" each time. Knowing that 30%

of respondents are undecided is of little use! So a lot of time and effort should be placed on the construction of survey items. One of the benefits of having forced-choice items is that each response is coded so that the results can be quickly entered and analyzed using statistical software. The analysis takes much longer when respondents give lengthy responses that must be analyzed in a different way. Surveys are useful in examining stated values, attitudes, opinions, and reporting on practices. However, they are based on self-report or what people say they do rather than on observation and this can limit accuracy.

## Developmental Designs

Developmental designs are techniques used in developmental research (and other areas as well). These techniques try to examine how age, cohort, gender, and social class impact development.

## Longitudinal Research

Longitudinal research involves beginning with a group of people who may be of the same age and background, and measuring them repeatedly over a long period of time. One of the benefits of this type of research is that people can be followed through time and be compared with them when they were younger.
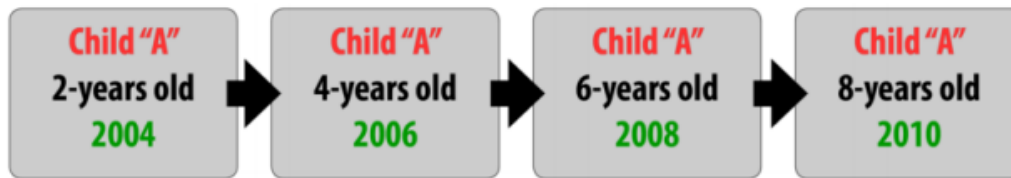


*Figure 1.8: A longitudinal research design. (Image by NOBA is licensed under CC By-NC-SA 4.0)*

A problem with this type of research is that it is very expensive and subjects may drop out over time.
In Canada, the National Longitudinal Survey of Children and Youth which began in 1994 is an example of a longitudinal study that provided data on children's development. Surveys were conducted every 2 years with the last survey conducted in 2008-2009. The sample size was roughly 26,000 children aged 0-23 years.

## Cross-Sectional Research

Cross-sectional research involves beginning with a sample that represents a cross-section of the population. Respondents who vary in age, gender, ethnicity, and social class might be asked to complete a survey about television program preferences or attitudes toward the use of the internet. The attitudes of males and females could then be compared, as could attitudes based on age. In cross-sectional research, respondents are measured only once.
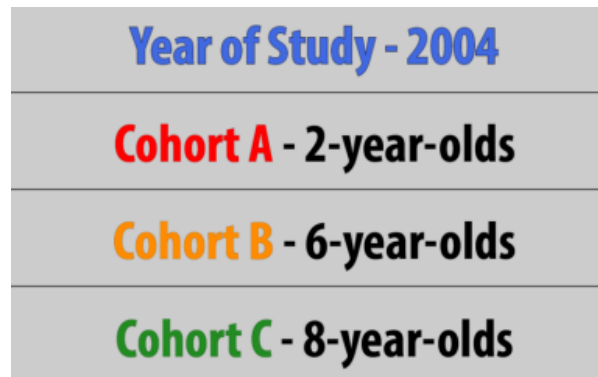
*Figure 1.9: A cross-sectional research design (Image by NOBA is licensed under CC By-NC-SA 4.0)*

This method is much less expensive than longitudinal research but does not allow the researcher to distinguish between the impact of age and the cohort effect. Different attitudes about the use of technology, for example, might not be altered by a person's biological age as much as their life experiences as members of a cohort.

## Sequential Research

Sequential research involves combining aspects of the previous two techniques; beginning with a cross-sectional sample and measuring them through time.
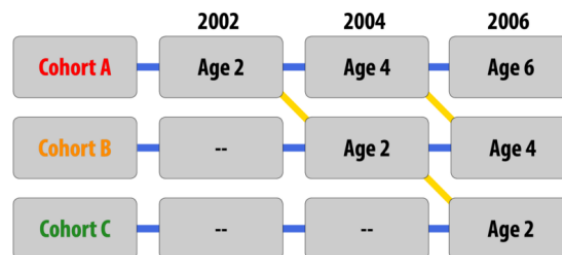


*Figure 1.10: A sequential research design (Image by NOBA is licensed under CC By-NC-SA 4.0)*

This is the perfect model for looking at age, gender, social class, and ethnicity. But the drawbacks of high costs and attrition are here as well (Lumen Learning, n.d.).

| Type of Research Design | Advantages | Disadvantages |
| --- | --- | --- |
| **Longitudinal** | • Examines changes within individuals over time<br>• Provides a developmental analysis | • Expensive<br>• Takes a long ti…<br>• Participant attr…<br>• Possibility of pr…<br>• Cannot examir… |
| **Cross-sectional** | • Examines changes between participants of different ages at the same point in time<br>• Provides information on age-related change | • Cannot examir…<br>• Cannot examir… |
| **Sequential** | • Examines changes within individuals over time<br>• Examines changes between participants of different ages at the same point in time<br>• Can be used to examine cohort effects | • May be expens…<br>• Possibility of pr… |

Table 1.1: Advantages and disadvantages of different research designs, (Lukowski & Milojevich, 2021).

## Qualitative Research in Early Childhood

Qualitative research involves describing and explaining an individual or group experience, a phenomenon or a situation. Such research is conducted with a focus on discovery and therefore open-ended. Information (data) collected and analyzed are in the form of narratives and images obtained from in-depth interviews, observations, documents, and physical artifacts. The following are some research methods used in qualitative research.

| Method | Purpose |
| --- | --- |
| Biography | To study lives of individuals.<br>Collect stories and report individual experiences.<br>E.g.. Early educator's living and working experience in northern rural communities in British Columbia. |
| Grounded theory | To generate a theory that explains a phenomenon. Study processes, activities and events that occur.<br>E.g. Coping strategies of children and families living with aplastic anemia. |
| Ethnography | To study culture of a particular group.<br>Describe and interpret shared patterns of behaviour, beliefs and language.<br>E.g. Children, families and educators in Forest Schools. |

Table 1.2: Qualitative research methods, (Lukowski & Milojevich, 2021)

## CANADA'S CONTRIBUTION TO CHILD DEVELOPMENT RESEARCH

Canada has a long history of contributing to child development research.

In 1892, James Mark Baldwin was appointed the first social scientist at the University of Toronto where he set up Canada's first psychological research laboratory. Baldwin proposed a social psychological perspective in studying child development and believed that development occurs in stages. He explained that

development of physical movement proceeds from simple to complex and eventually leads to more sophisticated mental processes. Jean Piaget (1896 – 1980) later advanced this idea further.

Dr. Jean Clinton of McMaster University (Hamilton, Ontario) is an internationally renowned advocate for children's issues. Her research focus is in brain development and the role social relationships play in development.

Dr. Fraser Mustard (1927-2011) created the "Canadian Institute for Advanced Research". Of particular interest to Dr. Mustard was the role of communities in early childhood. In 1999, along with Dr. Margaret McCain (1934- ), he prepared the influential report "The Early Years Study – Reversing the Real Brain Drain" for the Ontario government. The report emphasized promoting early child development centres for young children and parents by: boosting spending on early childhood education to the same levels as in K to 12, making programs available to all income levels, and encouraging local parent groups and businesses to set up these programs instead of the government, when possible.  In 2007, Dr. Mustard, Dr. McCain and Dr. Stuart Shanker wrote a follow-up report critical of Ontario's progress and calling for national early childhood development programs.

Dr. Stuart Shanker (1952- ) is Canada's leading expert in the psychosocial theory of self-regulation. Richard Tremblay (1944- ) holds the Canadian Research Chair in Child Development. His research focusses on the development of aggressive behaviour in children and whether early intervention programs can reduce chances of children turning to crime as adults. Dr. Mariana Brussoni of the University of British Columbia is currently active researching the developmental importance of risky play in childhood. Her focus is child injury prevention as well as the influence of culture on parenting in relationship to risky play and safety.

In 1925, Professor Edward Alexander Bott established the St. George's School for Child Study at the University of Toronto, which would eventually come to be known as The Institute for Child Study. It has been and continues to be, highly influential in developing Ontario's early childcare and education system.

Statistics Canada, in partnership with Human Resources Development Canada, undertook a major Canadian research initiative in 1994 titled "National Longitudinal Survey of Children and Youth (NLSCY)". Researchers tracked multiple variables affecting children's emotional, social and behavioural development over a period of time, using both longitudinal and cross-sectional sampling. Families from all 10 provinces and territories were included with the exception of families living on First Nations reserves, in extremely remote areas of Canada and full-time members the Canadian Armed Forces. These exclusions should be kept in mind when extrapolating the data.

This is just a small selection of Canadian researchers who have contributed, and continue to contribute, to our knowledge of how best to support the development of young children.

## Consent and Ethics in Research

Research should, as much as possible, be based on participants' freely volunteered informed consent. For minors, this also requires consent from their legal guardians. This implies a responsibility to explain fully and meaningfully to both the child and their guardians what the research is about and how it will be disseminated. Participants and their legal guardians should be aware of the research purpose and procedures, their right to refuse to participate; the extent to which confidentiality will be maintained; the potential uses to which the data might be put; the foreseeable risks and expected benefits; and that participants have the right to discontinue at any time.

But consent alone does not absolve the responsibility of researchers to anticipate and guard against potential harmful consequences for participants (Lumen Learning, n.d.). It is critical that researchers protect all rights of the participants including
Confidentiality.

The Canadian Psychological Association (2017) has published the Canadian Code of Ethics for Psychologists, which sets out four ethical principles Canadian psychologists must consider when conducting research: In order of priority, the four principles are:

- Principle I: Respect for the Dignity of Persons and Peoples

- Principle II: Responsible Caring

- Principle III: Integrity in Relationships

- Principle IV: Responsibility to Society

While all four principles should be taken into account, there may be times when there is a conflict between the principles. For example; what is best for society might not respect the dignity of persons and people. In this situation, more weight should be given to Principle 1 than Principle 4 in order to make an ethical decision.

Child development is a fascinating field of study – but care must be taken to ensure that researchers use appropriate methods to examine infant and child behaviour, use the correct experimental design to answer their questions, and be aware of the special challenges that are part-and-parcel of developmental research. Hopefully, this information helped you develop an understanding of these various issues and to be ready to think more critically about research questions that interest you. There are so many interesting questions that remain to be examined by future generations of developmental scientists – maybe you will make one of the next big discoveries! Another really important framework to use when trying to understand children's development are theories of development.

Let's explore what theories are and introduce you to some major theories in child development.

The College of Early Childhood Educators (2017), clearly articulates in a number of

places in the Code of Ethics & Standards of Practice for Early Childhood Educators in Ontario, the expectation that RECEs are as knowledgeable about research and theories related to children's development. Let's explore what is meant by a child development theory and why they are important to practice.

**What is a theory?**

In our attempts to make sense of the world and our human experience, it is in our nature to ask questions and develop theories, both formal and informal. This begins at an early age and as we move through this text, we will explore examples of children developing and testing their theories.

While it is true that students sometimes feel intimidated by theory; even the phrase, "Now we are going to look at some theories…" is met with blank stares and other indications that the audience is now lost. But theories are valuable tools for understanding human behaviour and development. Indeed, they are proposed explanations for the "how" and "whys" of development. Have you ever wondered, "Why is my 3 year old so inquisitive?" or "Why are some fifth graders rejected by their classmates?" A theory is an organized way to make sense of information. Theories can help to make predictions and explain these and other occurrences. Theories can be further tested through research. Developmental theories offer explanations about how we develop, why we change over time, and the kinds of influences that impact development.

Further, a theory guides how information is collected, how it is interpreted, and how it is applied to real-life situations. It provides the researcher with a blueprint or model to be used to help piece together various studies. Think of theories as frameworks or guidelines much like directions that come with an appliance or other object that requires assembly. The instructions can help one piece together smaller parts more easily than if trial and error are used.

Theories can be developed using induction in which a number of single cases are observed and after patterns or similarities are noted, the theorist develops ideas based on these examples. Established theories are then tested through research; however, not all theories are equally suited to scientific investigation. Some theories are difficult to test but are still useful in stimulating debate or providing concepts that have practical application. Keep in mind that theories are not facts; they are guidelines for investigation and practice, and they gain credibility through research that fails to disprove them (Lumen Learning, n.d.).

Before we examine some foundational child development theories, let's take a preliminary look at the theorists who have contributed to our current understanding of child development. Take a moment to scan the images of the theorists included in the next few pages.  Find some words to describe what you notice. Can you identify groups who are not represented in this group of theorists? If your answer included women, people of colour, visible minorities and/or Indigenous people as examples you are correct!

Academics and researchers have, and do, develop theories and frameworks

for thinking critically about human knowledge and systems. Critical theory is an example of a postmodern theory the aim of which is to unmask the ideology that falsely justifies some form of economic or social oppression and to see it for what it is...ideology! This can set in motion the task of ending the oppression.

Today many nations are actively addressing the legacies of colonialism that brought with it such things as patriarchy, eurocentrism, and structuralism. It has been feminist theory, queer theory, Indigenous peoples, and other marginalized groups who, over the past few years, have helped to draw attention to, and disrupt, what, in socio-cultural terms are often referred to as dominant discourses and grand narratives. These ways of describing the world and human experience tend to align with a Western ideology with embedded hierarchies and colonist world views. Historically, these narratives have served to advantage certain populations while pathologizing and further marginalizing others. The process of reconceptualizing is embraced as a way to move forward with social justice.

For more information check out  Reconceptualizing Early Childhood Education.

Critical theory demands that we adopt a postmodern perspective of child development and encourages early educators to reexamine ideologies, beliefs, and assumptions and to question and look beyond the fixed views of children proposed by existing theories. In everyday practice, this may look like critically examining a storybook for any hidden political or social points of view ( e.g. gender, race, class) made through the stories and images. Posing questions such as whose story is this? Who gets to tell the story? Is it a true representation? Who has been left out? Educators are encouraged to engage in conversations with families and children about representations, a practice that lives into the four foundations of How Does Learning Happen?

In sum, postmodernism denies the existence of one objective view of child development but rather encourages multiple perspectives of viewing how children develop and learn.

Within the dominant discourse described above, the scientific method was lauded as the way to objectively quantify and describe the world, including human development and diversity.  We are reconceptualizing science as one of many ways to describe and make meaning of the world and human experience. We are only here today because our ancestors survived and flourished for millennia. They shared their experiences across generations through oral tradition and art as examples.

## INDIGENOUS PERSPECTIVES

In Indigenous cultures, children are viewed as sacred gifts from the Creator and therefore their growth is seen as a spiritual journey of development and learning. The Medicine Wheel that symbolizes stages of life is used to represent this sacred journey. First Nation, Inuit, and Metis families are interdependent and with each stage of life, each member brings special gifts as well as responsibilities to the family and community. Elders, who are considered knowledge keepers, bring teachings from ancestors to help children understand their sacred place

in the universe. Indigenous communities view child development as a journey that is closely bound by the natural and spiritual world and therefore the developing child is shaped by unique ways of knowing and teachings.

*For further reading:*
A child becomes strong: Journeying through each stage of the life cycle.

We are now beginning to embrace these ways of living in the world. One way to begin to integrate these world views is through 'Two-Eyed Seeing'.  This guiding principle refers to learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing … and learning to use both these eyes together, for the benefit of all. Shared by Elder Albert Marshall in 2004 'Two-Eyed Seeing' is the gift of multiple perspective treasured by many Indigenous peoples (Institute for Integrative Science and Health, n.d.), and refers to shifting from the Western binary dualism of 'either/or' to embracing the positive in both of these world views as 'both/and'.

Please note that the above is not a critique of science. We do not have to look too far to see evidence of just how much science has contributed to global human health and well-being. It is about HOW science has been used to often deny rather than embrace human diversity.

## LET'S TAKE A LOOK AT SOME KEY THEORIES IN CHILD DEVELOPMENT.

### Sigmund Freud's Psychosexual Theory

We begin with the often controversial figure, Sigmund Freud (1856-1939). Freud has been a very influential figure in the area of development; his view of development and psychopathology dominated the field of psychiatry until the growth of behaviourism in the 1950s. His assumptions that personality forms during the first few years of life and that the ways in which parents or other caregivers interact with children have a long-lasting impact on children's emotional states have guided parents, educators, clinicians, and policy-makers for many years. We have only recently begun to recognize that early childhood experiences do not always result in certain personality traits or emotional states. There is a growing body of literature addressing resilience in children who experience trauma and yet develop without damaging emotional scars (O'Grady and Metz, 1987, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Freud has stimulated an enormous amount of research and generated many ideas. Agreeing with Freud's theory in its entirety is hardly necessary for appreciating the contribution he has made to the field of development.
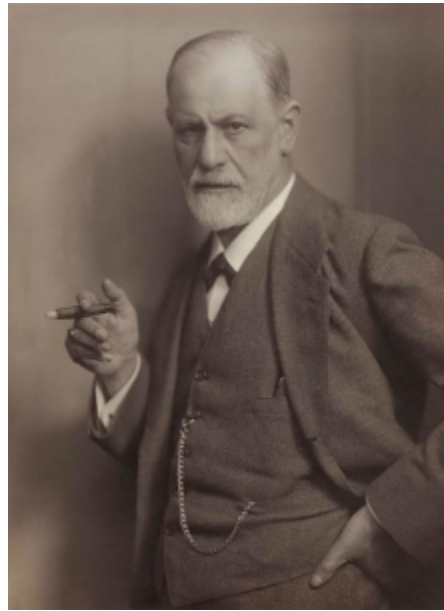
*Figure 1.11: Sigmund Freud (Image is in the public domain)*

Freud's theory of self suggests that there are three parts of the self.

- The **id** is the part of the self that is inborn. It responds to biological urges without pause and is guided by the principle of pleasure: if it feels good, it is the thing to do. A newborn is all id. The newborn cries when hungry and defecates when the urge strikes.

- The **ego** develops through interaction with others and is guided by logic or the reality principle. It has the ability to delay gratification. It knows that urges have to be managed. It mediates between the id and superego using logic and reality to calm the other parts of the self.

- The **superego** represents society's demands for its members. It is guided by a sense of guilt. Values, morals, and the conscience are all part of the superego.

The personality is thought to develop in response to the child's ability to learn to manage biological urges. Parenting is important here. If the parent is either overly punitive or lax, the child may not progress to the next stage. Here is a brief introduction to Freud's stages.

**Table 1.3 Sigmund Freud's Psychosexual Theory**

| Name of Stage | Description of Stage |
| --- | --- |
| Oral Stage | The **oral stage** lasts from birth until around age 2. The infant is all id. At this stage, all stimulation and comfort is focused on the mouth and is based on the reflex of sucking. Too much indulgence or too little stimulation may lead to fixation. |
| Anal Stage | The **anal stage** coincides with potty training or learning to manage biological urges. The ego is beginning to develop in this stage. Anal fixation may result in a person who is compulsively clean and organized or one who is sloppy and lacks self-control |
| Phallic Stage | The **phallic stage** occurs in early childhood and marks the development of the superego and a sense of masculinity or femininity as culture dictates. |
| Latency | **Latency** occurs during middle childhood when a child's urges quiet down and friendships become the focus. The ego and superego can be refined as the child learns how to cooperate and negotiate with others. |
| Genital Stage | The **genital stage** begins with puberty and continues through adulthood. Now the preoccupation is that of sex and reproduction. |

## Strengths and Weaknesses of Freud's Theory

Freud's theory has been heavily criticized for several reasons. One is that it is very difficult to test scientifically. How can parenting in infancy be traced to personality in adulthood? Are there other variables that might better explain development? The theory is also considered to be sexist in suggesting that women who do not accept an inferior position in society are somehow psychologically flawed. Freud focuses on the darker side of human nature and suggests that much of what determines our actions is unknown to us. So why do we study Freud? As mentioned above, despite the criticisms, Freud's assumptions about the importance of early childhood experiences in shaping our psychological selves have found their way into child development, education, and parenting practices. Freud's theory has heuristic value in providing a framework from which to elaborate and modify subsequent theories of development. Many later theories, particularly behaviourism and humanism, were challenges to Freud's views (Overstreet, n.d., as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

**Main Points to Note About Freud's Psychosexual Theory**
Freud believed that:

- Development in the early years has a lasting impact.
- There are three parts of the self: the id, the ego, and the superego
- People go through five stages of psychosexual development: the oral stage, the anal stage, the phallic stage, latency, and the genital stage

We study Freud because the assumptions about the importance of early childhood experience provide a framework for later theories (they both elaborated and contradicted/challenged the work).

## Erik Erikson's Psychosocial Theory

Now, let's turn to a less controversial theorist, Erik Erikson. Erikson (1902-1994) suggested that our relationships and society's expectations motivate much of our behaviour in the theory of psychosocial development. Erikson was a student of Freud's but emphasized the importance of the ego, or conscious thought, in determining our actions. In other words, he believed that we are not driven by unconscious urges. We know what motivates us and we consciously think about how to achieve our goals. He is considered the father of developmental psychology because this model gives us a guideline for the entire life span and suggests certain primary psychological and social concerns throughout life.

*Figure 1.12: Erik Erikson (Image is in the public domain)*

Erikson expanding on Freud's theories by emphasizing the importance of culture in parenting practices and motivations and adding three stages of adult development (Erikson, 1950; 1968, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

He believed that we are aware of what motivates us throughout life and the ego has greater importance in guiding our actions than does the id. We make conscious choices in life and these choices focus on meeting certain social and cultural needs rather than purely biological ones. Humans are motivated, for instance, by the need to feel that the world is a trustworthy place, that we are capable individuals, that we can make a contribution to society, and that we have lived a meaningful life. These are all psychosocial problems.

Erikson divided the lifespan into eight stages. In each stage, we have a major psychosocial task to accomplish or a crisis to overcome. Erikson believed that our personality continues to take shape throughout our lifespan as we face these challenges in living. Here is a brief overview of the eight stages.

### Table 1.4 Erik Erikson's Psychosocial Theory

| Name of Stage | Description of Stage |
| --- | --- |
| Trust vs. mistrust (0-1) | The infant must have basic needs met in a consistent way in order to feel that the world is a trustworthy place. |
| Autonomy vs. shame and doubt (1-2) | Mobile toddlers have newfound freedom they like to exercise and by being allowed to do so, they learn some basic independence. |
| Initiative vs. Guilt (3-5) | Preschoolers like to initiate activities and emphasize doing things "all by myself." |
| Industry vs. inferiority (6- 11) | School-aged children focus on accomplishments and begin making comparisons between themselves and their classmates |
| Identity vs. role confusion (adolescence) | Teenagers are trying to gain a sense of identity as they experiment with various roles, beliefs, and ideas. |
| Intimacy vs. Isolation (young adulthood) | In our 20s and 30s we are making some of our first long-term commitments in intimate relationships. |
| Generativity vs. stagnation (middle adulthood) | The 40s through the early 60s we focus on being productive at work and home and are motivated by wanting to feel that we've made a contribution to society. |
| Integrity vs. Despair (late adulthood) | We look back on our lives and hope to like what we see-that we have lived well and have a sense of integrity because we lived according to our beliefs. |

These eight stages form a foundation for discussions on emotional and social development during the life span. Keep in mind, however, that these stages or crises can occur more than once. For instance, a person may struggle with a lack of trust beyond infancy under certain circumstances. Erikson's theory has been criticized for focusing so heavily on stages and assuming that the completion of one stage is a prerequisite for the next crisis of development. This theory also focuses on the social expectations that are found in certain cultures, but not in all.

For instance, the idea that adolescence is a time of searching for identity might translate well in the middle-class culture of Canada, but not as well in cultures where the transition into adulthood coincides with puberty through rites of passage and where adult roles offer fewer choices (Lumen Learning, n.d.).

**Main Points to Note About Erikson's Psychosocial Theory**
Erikson was a student of Freud but focused on conscious thought.

- Stages of psychosocial development address the entire lifespan and suggest a primary psychosocial crisis in some cultures that adults can use to understand how to support children's social and emotional development.

- The stages include trust vs. mistrust, autonomy vs. shame and doubt, initiative vs. guilt, industry vs. inferiority, identity vs. role confusion, intimacy vs. isolation, generativity vs. stagnation, and integrity vs. despair.

## BEHAVIOURISM

While Freud and Erikson looked at what was going on in the mind, behaviourism rejected any reference to mind and viewed overt and observable behaviour as the proper subject matter of psychology. Through the scientific study of behaviour, it was hoped that laws of learning could be derived that would promote the prediction and control of behaviour (Baker & Sperry, 2021).

### Ivan Pavlov

**Ivan Pavlov** (1880-1937) was a Russian physiologist interested in studying digestion. As he recorded the amount of salivation laboratory dogs produced as they ate, he noticed that they actually began to salivate before the food arrived as the researcher walked down the hall and toward the cage. "This," he thought, "is not natural!" One would expect a dog to automatically salivate when the food hit their palate, but BEFORE the food comes? Of course, what had happened was . . . you tell me. That's right! The dogs knew that the food was coming because they had learned to associate the footsteps with the food. The keyword here is "learned". A learned response is called a "conditioned" response.
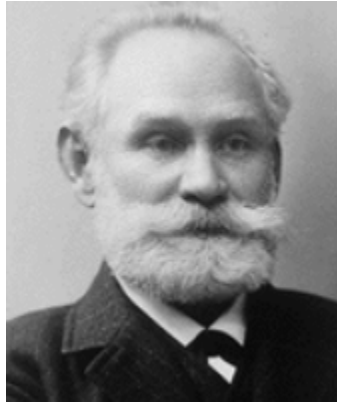
*Figure 1.13: Ivan Pavlov (Image
is in the public domain)*

Pavlov began to experiment with this concept of **classical conditioning**. Pavlov began to ring a bell, for instance, prior to introducing the food. Sure enough, after making this connection several times, the dogs could be made to salivate to the sound of a bell. Once the bell had become an event to which the dogs had learned to salivate, it was called a **conditioned stimulus**. The act of salivating to a bell was a response that had also been learned, now termed in Pavlov's jargon, a conditioned response. Notice that the response, salivation, is the same whether it is conditioned or unconditioned (unlearned or natural). What changed is the stimulus to which the dog salivates. One is natural (unconditioned) and one is learned (conditioned).

Let's think about how classical conditioning is used on us. One of the most widespread applications of classical conditioning principles was brought to us by the psychologist, John B. Watson.

## John B. Watson

John B. Watson (1878-1958) believed that most of our fears and other emotional responses are classically conditioned. Watson gained a good deal of popularity in the 1920s when expert advice on parenting was offered to the public. However, this type of research is now known to be unethical and that this type of parenting is inappropriate.



*Figure 1.14: John B. Watson (Image
is in the public domain)*

Watson tried to demonstrate the power of classical conditioning with the famous experiment with an 18-month-old boy named "Little Albert". Watson sat Albert down and introduced a variety of seemingly scary objects: a burning piece of newspaper, a white rat, etc. But Albert remained curious and reached for all of these things. Watson knew that one of our only inborn fears is the fear of loud noises so Watson proceeded to make a loud

noise each time one of Albert's favorites, a white rat, was introduced. After hearing the loud noise several times paired with the rat, Albert soon came to fear the rat and began to cry when it was introduced. Watson filmed this experiment for posterity and used it to demonstrate that he could help parents achieve any outcomes they desired, if they would only follow the advice. Watson wrote columns in newspapers and in magazines and gained a lot of popularity among parents eager to apply science to household order.

Operant conditioning, on the other hand, looks at the way the consequences of a behaviour increase or decrease the likelihood of a behaviour occurring again. So let's look at this a bit more.

## B.F. Skinner and Operant Conditioning

B. F. Skinner (1904-1990), who brought us the principles of operant conditioning, suggested that reinforcement is a more effective means of encouraging a behaviour than is criticism or punishment. By focusing on strengthening desirable behaviour, we have a greater impact than if we emphasize what is undesirable. Reinforcement is anything that an organism desires and is motivated to obtain.



*Figure 1.15: B.F. Skinner (Image is in the public domain)*

A **reinforcer** is something that encourages or promotes a behaviour. Some things are natural rewards. They are considered intrinsic or primary because their value is easily understood. Think of what kinds of things babies or animals such as puppies find rewarding.

Extrinsic or secondary reinforcers are things that have a value not immediately understood. Their value is indirect. They can be traded in for what is ultimately desired.

The use of **positive reinforcement** involves adding something to a situation in order to encourage a behaviour. For example, if I give a child a high five for cleaning a room, or compliment the job they have done they are more likely to do it again. Think of ways in which you positively reinforce others.

**Negative reinforcement** occurs when taking something unpleasant away from a situation encourages behaviour. For example, I have an alarm clock that makes a very unpleasant, loud sound when it goes off in the morning. As a result, I get up and turn it off. By removing the noise, I am reinforced for getting up. How do you negatively reinforce others?

**Punishment** is an effort to stop a behaviour. It means to follow an action with something unpleasant or painful. Punishment is often less effective than reinforcement for several reasons. It doesn't indicate the desired behaviour, it may result in suppressing rather than stopping a behaviour, (in other words, the person may not do what is being punished when you're around, but may do it often when you leave), and a focus on punishment can result in not noticing when the person does well. Not all behaviours are learned through association or reinforcement. Many of the things we do are learned by watching others. This is addressed in social learning theory.

## SOCIAL LEARNING THEORY

**Albert Bandura** (1925-) is a leading contributor to social learning theory. He calls our attention to the ways in which many of our actions are not learned through conditioning; rather, they are learned by watching others (1977). Young children frequently learn behaviours through imitation



*Figure 1.16: Albert Bandura (Image by Albert Bandura is licensed under CC BY-SA 4.0)*

Sometimes, particularly when we do not know what else to do, we learn by modeling or copying the behaviour of others. A kindergartner on their first day of school might eagerly look at how others are acting and try to act the same way to fit in more quickly. Adolescents struggling with their identity rely heavily on their peers to act as role-models. Sometimes we do things because we've seen it pay off for someone else. They were operantly conditioned, but we engage in the behaviour because we hope it will pay off for us as well. This is referred to as vicarious reinforcement (Bandura, Ross and Ross, 1963, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

Bandura (1986, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) suggests that there is interplay between the environment and the individual. We are not just the product of our surroundings, rather we influence our surroundings. Parents not only influence their child's environment, perhaps intentionally through the use of reinforcement, etc., but children influence parents as well. Parents may respond differently with their first child than with their fourth. Perhaps they try to be the perfect parents with their firstborn, but by the time their last child comes along they have very different expectations both of themselves and their child. Our environment creates us and we create our environment (Lumen Learning, n.d.).

**Bandura and the Bobo Doll Experiment & Today's Children and the Media**

Other social influences: TV or not TV? Bandura et al. (1963, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) began a series of studies to look at the impact of television, particularly commercials, on the behaviour of children. Are children more likely to act out aggressively when they see this behaviour modeled? What if they see it being reinforced? Bandura began by conducting an experiment in which he showed children a film of a person hitting an inflatable clown or "bobo" doll. Then the children were allowed in the room where they found the doll and immediately began to hit it. This was without any

reinforcement whatsoever. Not only that, but they found new ways to behave aggressively. It's as if they learned an aggressive role.

Children view far more television today than in the 1960s; so much, in fact, that they have been referred to as Generation M (media). The amount of screen time varies by age. As of 2017, children 0-8 spend an average of 2 hours and 19 minutes. Children 8-12 years of age spend almost 6 hours a day on screen media. And 13- to 18-year-olds spend an average of just under 9 hours a day in entertainment media use.

The prevalence of violence, sexual content, and messages promoting foods high in fat and sugar in the media are certainly cause for concern and the subjects of ongoing research and policy review. Many children spend even more time on the computer viewing content from the internet. The amount of time spent connected to the internet continues to increase with the use of smartphones that essentially serve as mini-computers. And the ways children and adolescents interact with the media continues to change. The popularity of YouTube and the various social media platforms are examples of this. What might be the implications of this? (Rasmussen, 2017).

**Main Points to Note About Behaviourism**

Behaviourists look at observable behaviour and how it can be predicted and controlled.

- Pavlov experimented with classical conditioning, the process of conditioning response to stimulus (the dog's salivating to the bell).

- Watson offered advice to parents to show them how classical conditioning can be used. The most famous experiment was conditioning Little Albert to fear a white rat.

- Skinner believed that reinforcing behaviour is the most effective way of increasing desirable behaviour. This is done through operant conditioning.

- Bandura noted that many behaviours are not learned through any type of conditioning, but rather through imitation. And he believed that people are not only influenced by their surroundings but that they also have an impact on their surroundings.

Theories also explore cognitive development and how mental processes change over time.

## JEAN PIAGET'S THEORY OF COGNITIVE DEVELOPMENT

Jean Piaget (1896-1980) is one of the most influential cognitive theorists. Piaget was inspired to explore children's ability to think and reason by watching his own children's development. He was one of the first to recognize and map out the ways in which children's thought differs from that of adults. Piaget's interest in this area began when he was asked to test the IQ of children and began to notice that there was a pattern in their wrong answers. Piaget

believed that children's intellectual skills change over time through maturation. Children of differing ages interpret the world differently.



*Figure 1.17: Jean Piaget (Image is in the public domain)*

Piaget believed our desire to understand the world comes from a need for cognitive **equilibrium**. This is an agreement or balance between what we sense in the outside world and what we know in our minds. If we experience something that we cannot understand, we try to restore the balance by either changing our thoughts or by altering the experience to fit into what we do understand. Perhaps you meet someone who is very different from anyone you know. How do you make sense of this person? You might use them to establish a new category of people in your mind or you might think about how they are similar to someone else.

A **schema** or schemes are categories of knowledge. They are like mental boxes of concepts. A child has to learn many concepts. They may have a scheme for "under" and "soft" or "running" and "sour". All of these are schema. Our efforts to understand the world around us lead us to develop new schema and to modify old ones.

One way to make sense of new experiences is to focus on how they are similar to what we already know. This is **assimilation**. So the person we meet who is very different may be understood as being "sort of like my sibling" or "that voice sounds a lot like yours." Or a new food may be assimilated when we determine that it tastes like chicken!

Another way to make sense of the world is to change our mind. We can make a cognitive accommodation to this new experience by adding new schema. This food is unlike anything I've tasted before. I now have a new category of foods that are bitter-sweet in flavor, for instance. This is **accommodation**. Do you accommodate or assimilate more frequently? Children accommodate more frequently as they build new schema. Adults tend to look for similarity in their experience and assimilate. They may be less inclined to think "outside the box." Piaget suggested different ways of understanding that are associated with maturation. This was divided into four stages.

**Table 1.5 Piaget's Theory of Cognitive Development**

| Name of Stage | Description of Stage |
|---|---|
| Sensorimotor Stage | During the **sensorimotor stage** children rely on use of the senses and motor skills. From birth until about age 2, the infant knows by tasting, smelling, touching, hearing, and moving objects around. This is a real hands on type of knowledge. |
| Preoperational Stage | In the **preoperational stage**, children from ages 2 to 7, become able to think about the world using symbols. A **symbol** is something that stands for something else. The use of language, whether it is in the form of words or gestures, facilitates knowing and communicating about the world. This is the hallmark of preoperational intelligence and occurs in early childhood. However, these children are preoperational or pre-logical. They still do not understand how the physical world operates. They may, for instance, fear that they will go down the drain if they sit at the front of the bathtub, even though they are too big. |
| Concrete Operational | Children in the **concrete operational** stage, ages 7 to 11, develop the ability to think logically about the physical world. Middle childhood is a time of understanding concepts such as size, distance, and constancy of matter, and cause and effect relationships. A child knows that a scrambled egg is still an egg and that 8 ounces of water is still 8 ounces no matter what shape of glass contains it. |
| Formal Operational | During the **formal operational** stage children, at about age 12, acquire the ability to think logically about concrete and abstract events. The teenager who has reached this stage is able to consider possibilities and to contemplate ideas about situations that have never been directly encountered. More abstract understanding of religious ideas or morals or ethics and abstract principles such as freedom and dignity can be considered. |

## Criticisms of Piaget's Theory

Piaget has been criticized for overemphasizing the role that physical maturation plays in cognitive development and underestimating the role that culture and interaction (or experience) plays in cognitive development. Looking across cultures reveals considerable variation in what children are able to do at various ages. Piaget may have underestimated what children are capable of given the right circumstances (Lumen Learning, n.d.).

**Note About Piaget's Theory of Cognitive Development**

Piaget, one of the most influential cognitive theorists, believed that

- Understanding is motivated by trying to balance what we sense in the world and what we know in our minds.

- Understanding is organized through creating categories of knowledge. When presented with new knowledge we may add new schema or modify existing ones.

Children's understanding of how the world changes in their cognitive skills mature through four stages: sensorimotor stage, preoperational stage, concrete operational stage, and formal operational stage.

## LEV VYGOTSKY'S SOCIOCULTURAL THEORY

Lev Vygotsky (1896-1934) was a Russian psychologist who wrote in the early 1900s but whose work was discovered in the United States in the 1960s but became more widely known in the 1980s. Vygotsky differed with Piaget in that he believed that a person not only has a set of abilities, but also a set of potential abilities that can be realized if given the proper guidance from others. Vygotsky's sociocultural theory emphasizes the importance of culture and interaction in the development of cognitive abilities. He believed that through guided participation known as scaffolding, with a teacher or capable peer, a child can learn cognitive skills within a certain range known as the **zone of proximal development** (Lumen Learning, n.d.).  This belief was that development occurred first through

children's immediate social interactions, and then moved to the individual level as they began to internalize their learning (Leon, n.d.)



*Figure 1.18: Lev Vygotsky (Image by the Vygotsky Project is licensed under CC BY-SA 3.0)*

Have you ever taught a child to perform a task? Maybe it was brushing their teeth or preparing food. Chances are you spoke to them and described what you were doing while you demonstrated the skill and let them work along with you all through the process. You gave them assistance when they seemed to need it, but once they knew what to do-you stood back and let them go. This is **scaffolding** and can be seen demonstrated throughout the world. This approach to teaching has also been adopted by educators. Rather than assessing students on what they are doing, they should be understood in terms of what they are capable of doing with the proper guidance.You can see how Vygotsky would be very popular with modern day educators (Lumen Learning, n.d.).

**Main Points to Note About Vygotsky's Sociocultural Theory**

Vygotsky concentrated on the child's interactions with peers and adults. He believed that the child was an apprentice, learning through sensitive social interactions with more skilled peers and adults.

## Comparing Piaget and Vygotsky

Vygotsky concentrated more on the child's immediate social and cultural environment and their interactions with adults and peers. While Piaget saw the child as actively discovering the world through individual interactions with

it, Vygotsky saw the child as more of an apprentice, learning through a social environment of others who had more experience and were sensitive to the child's needs and abilities (Leon, n.d.).

Like Vygotsky, Bronfenbrenner looked at the social influences on learning and development.

### INDIGENOUS PERSPECTIVES

Comparing Piaget and Vygotsky – both statements are right for indigenous culture, the child is seen as "actively discovering the world through individual interactions with it (children are encouraged to play outside) and, as more of an apprentice, learning through a social environment of others who had more experience and were sensitive to the child's needs and abilities." (Leon, n.d) Boys were around their mothers until the age of 7; subsequently, they would go with the men to learn the skills of protection and hunting (i.e. flint making, arrows, making nets, snowshoes, etc.) Today, in some families who are keeping the traditional ways of life alive, boys go hunting, trapping and, fishing with their father, a community member or another male relative; some as early as 7 or 8 for small game. When they reach the age of 11 or 12 they are encouraged to kill big game which is celebrated. They are encouraged to share the game with elders and/or other community members. Girls were traditionally taught skills such as cooking, tanning hides, putting up the teepee (or other forms of habitats), rearing children, fetching wood and water, as well as other chores. Today, it is not uncommon for girls to do the same as the boys with their father or with the whole family. Both girls and boys help with younger siblings, especially if there are many. Some of these may defer from nation to nation.

URIE BRONFENBRENNER'S ECOLOGICAL SYSTEMS MODEL

Urie Bronfenbrenner (1917-2005) offers us one of the most comprehensive theories of human development. Bronfenbrenner studied Freud, Erikson, Piaget, and learning theorists and believed that all of those theories could be enhanced by adding the dimension of context. What is being taught and how society interprets situations depends on who is involved in the life of a child and on when and where a child lives.
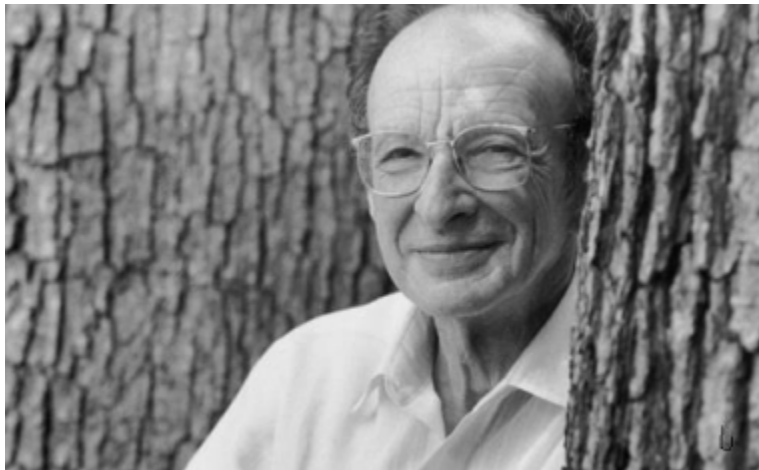


*Figure 1.19: Urie Bronfenbrenner (Image by Mario Vicente Gonzalez is licensed under CC BY-SA 4.0)*

Bronfenbrenner's ecological systems model explains the direct and indirect influences on an individual's development.

**Table 1.6 Urie Bronfenbrenner's Ecological Systems Model**

| Name of the System | Description of System |
|---|---|
| Microsystems | **Microsystems** impact a child directly. These are the people with whom the child interacts such as parents, peers, and teachers. The relationship between individuals and those around them need to be considered. For example, to appreciate what is going on with a student in math, the relationship between the student and teacher should be known. |
| Mesosystems | **Mesosystems** are interactions between those surrounding the individual. The relationship between parents and schools, for example, will indirectly affect the child. |
| Exosystem | Larger institutions such as the mass media or the healthcare system are referred to as the **exosystem**. These have an impact on families and peers and schools that operate under policies and regulations found in these institutions. |
| Macrosystems | We find cultural values and beliefs at the level of **macrosystems**. These larger ideals and expectations inform institutions that will ultimately impact the individual. |
| Chronosystem | All of this happens in a historical context referred to as the **chronosystem**. Cultural values change over time, as do policies of educational institutions or governments in certain political climates. Development occurs at a point in time. |

For example, in order to understand a student in math, we can't simply look at that individual and what challenges they face directly with the subject. We have to look at the interactions that occur between teacher and child. Perhaps the teacher needs to make modifications as well. The teacher may be responding to regulations made by the school, such as new expectations for students in math or constraints on time that interfere with the teacher's ability to instruct. These new demands may be a response to national efforts to promote math and science deemed important by political leaders in response to relations with other countries at a particular time in history.



*Figure 1.20: Bronfenbrenner's Ecological Systems Theory (Image by Ian Joslin is licensed under CC BY 4.0)*

Bronfenbrenner's ecological systems model challenges us to go beyond the individual if we want to understand human development and promote improvements (Leon, n.d.).

**Main Points to Note About Bronfenbrenner's Ecological Model**

After studying all of the prior theories, Bronfenbrenner added an important element of context to the discussion of influences on human development.

- He believed that the people involved in children's lives and when and where they live are important considerations.
- He created a model of nested systems that influence the child (and are influenced by the child) that include: microsystems, mesosystems, the exosystem, macrosystems, and chronosystems.

## INDIGENOUS PERSPECTIVES

As for Bronfenbrenner's Ecological Model: it seems the same as the saying: It takes a community to raise a child. In some indigenous communities, the aunts and uncles are the ones who "discipline" children to keep harmony in the family. Discipline in the sense that they talk to the children when they are not contributing to the household or when they are giving their parents a hard time. It is common for children to go live with either aunts and uncles, or grandparents for periods of time to learn different skills, knowledge and/or teachings as well as to go help out with child-rearing. There is a strong sense of sharing our gifts from the Creator, the children, with our extended family. They are considered to be lent to us by the Creator.

## Summary

In this chapter we looked at:

- underlying principles of development
- the five periods of development
- three issues in development
- various methods of research
- important theories that help us understand the development

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**CHAPTER 2**

## *Conception, Heredity and Prenatal Development*

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**Chapter Objectives**

After this chapter, you should be able to:

- Evaluate roles of nature and nurture in development.
- Define genes and chromosomes.
- Differentiate mitosis and meiosis.
- Explain dominant and recessive patterns on inheritance.
- List common genetic disorders and chromosomal abnormalities.
- Describe changes that occur within each of the three periods of prenatal development.
- Recognize the risks to prenatal development posed by exposure to teratogens.
- Evaluate different types of prenatal assessment.

### INTRODUCTION

In this chapter, we will begin by examining some of the ways in which heredity helps to shape the way we are. We will look at what happens genetically during conception, and describe some known genetic and chromosomal disorders. Next, we will consider what happens during prenatal development, including the impact of teratogens. We will also discuss the impact that both the mother and father have on the developing fetus (Lally & Valentine-French, 2019, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

### HEREDITY, NATURE & NURTURE

Most scholars agree that there is a constant interplay between nature (heredity) and nurture (the environment). It is difficult to isolate the root of any single characteristic as a result solely of nature or nurture, and most scholars believe that even determining the extent to which nature or nurture impacts a human feature is difficult to answer. In fact, almost all human features are polygenic (a result of many genes) and multifactorial (a result of many factors, both genetic and environmental). It's as if one's genetic make-up sets up a range of possibilities, which may or may not be realized depending upon one's environmental experiences. For instance, a person might be

genetically predisposed to develop diabetes, but the person's lifestyle may determine whether or not they actually develop the disease.

This bidirectional interplay between nature and nurture is the epigenetic framework, which suggests that the environment can affect the expression of genes just as genetic predispositions can impact a person's potentials. And environmental circumstances can trigger symptoms of a genetic disorder (Lumen Learning, n.d.).

This aspect of development is an important one for educators and caregivers to consider. In fact, in Ontario the College of Early Childhood Educators considers it a professional role and responsibility to demonstrate practice that embraces an understanding of the influence of a child's experiences on their overall development (College of Early Childhood Educators, 2017). This also includes working with families as partners to ensure the best outcomes for children.

## ENVIRONMENT CORRELATIONS

Environment Correlations refer to the processes by which genetic factors contribute to variations in the environment (Plomin, DeFries, Knopik, & Neiderhiser, 2013, as cited in Lumen Learning, n.d.). There are three types of genotype-environment correlations:

Passive genotype-environment correlation occurs when children passively inherit the genes and the environments their family provides. Certain behavioural characteristics, such as being athletically inclined, may run in families. The children have inherited both the genes that would enable success at these activities, and given the environmental encouragement to engage in these actions.



Figure 2.1: Two skiers. (Image by Alexey Ruban on Unsplash)

**Evocative genotype-environment correlation** refers to how the social environment reacts to individuals based on their inherited characteristics. For example, whether one has a more outgoing or shy temperament will affect whether or not they seek out others and how he or she is treated by others.

**Active genotype-environment correlation** occurs when individuals seek out environments that support their

genetic tendencies. This is also referred to as niche picking. For example, children who are musically inclined seek out music instruction and opportunities that facilitate their natural musical ability.

Conversely, **Genotype-Environment Interactions** involve genetic susceptibility to the environment. Adoption studies provide evidence for genotype-environment interactions. For example, the Early Growth and Development Study (Leve, Neiderhiser, Scaramella, & Reiss, 2010, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) followed 360 adopted children and their adopted and biological parents in a longitudinal study. Results have shown that children whose biological parents exhibited psychopathology, exhibited significantly fewer behaviour problems when their adoptive parents used more structured parenting than unstructured. Additionally, elevated psychopathology in adoptive parents increased the risk for the children's development of behaviour problems, but only when the biological parents' psychopathology was high. Consequently, the results show how environmental effects on behaviour differ based on the genotype, especially stressful environments on genetically at-risk children (Lally & Valentine-French, 2019).

## GENES AND CHROMOSOMES

Now, let's look more closely at just nature. Nature refers to the contribution of genetics to one's development. The basic building block of the nature perspective is the gene. Genes are recipes for making proteins, while proteins influence the structure and functions of cells. Genes are located on the chromosomes and there are an estimated 20,500 genes for humans, according to the Human Genome Project (NIH, 2015, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).
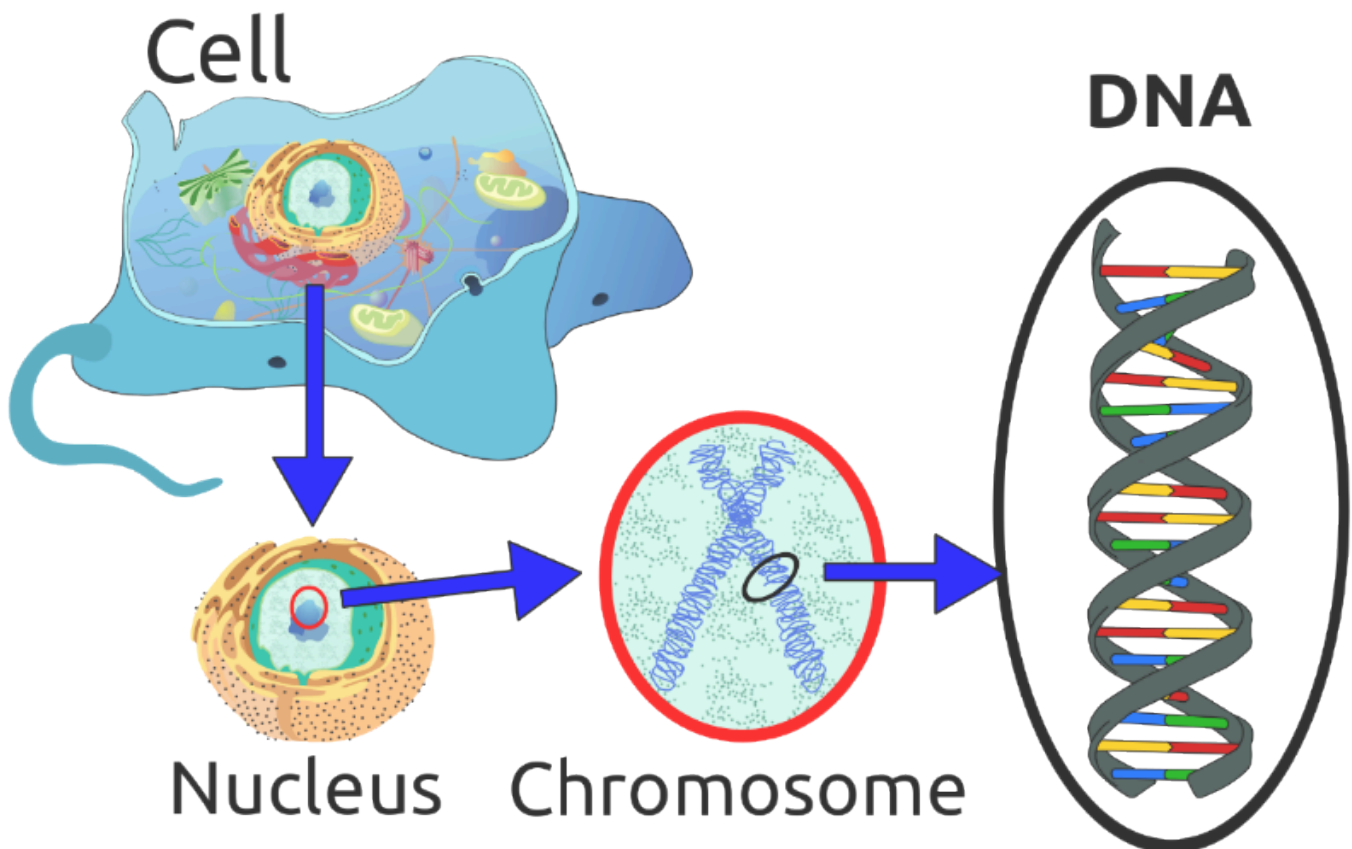


Figure 2.2: DNA's Location in the cell (Image by Radio89 is licensed under CC BY-SA 3.0 (original image has been modified)

Normal human cells contain 46 chromosomes (or 23 pairs; one from each parent) in the nucleus of the cells.

After conception, most cells of the body are created by a process called mitosis. Mitosis is defined as the cell's nucleus making an exact copy of all the chromosomes and splitting into two new cells.

However, the cells used in sexual reproduction, called the gametes (sperm or ova), are formed in a process called **meiosis**. In meiosis, the gamete's chromosomes duplicate, and then divide twice resulting in four cells containing only half the genetic material of the original gamete. Thus, each sperm and egg possesses only 23 chromosomes and combine to produce the normal 46.

| Type of Cell Division | Explanation | Steps |
|---|---|---|
| Mitosis | All cells, except those used in sexual reproduction, are created by mitosis | Chromosomes make a duplicate copy<br>Two identical cells are created |
| Meiosis | Cells used in sexual reproduction are created by meiosis | Exchange of gene between the chromosomes (crossing over)<br>Chromosomes make a duplicate<br>  First cell division<br>  Second cell division |

Table 2.1: Mitosis & Meiosis (Lally & Valentine-French, 2019).
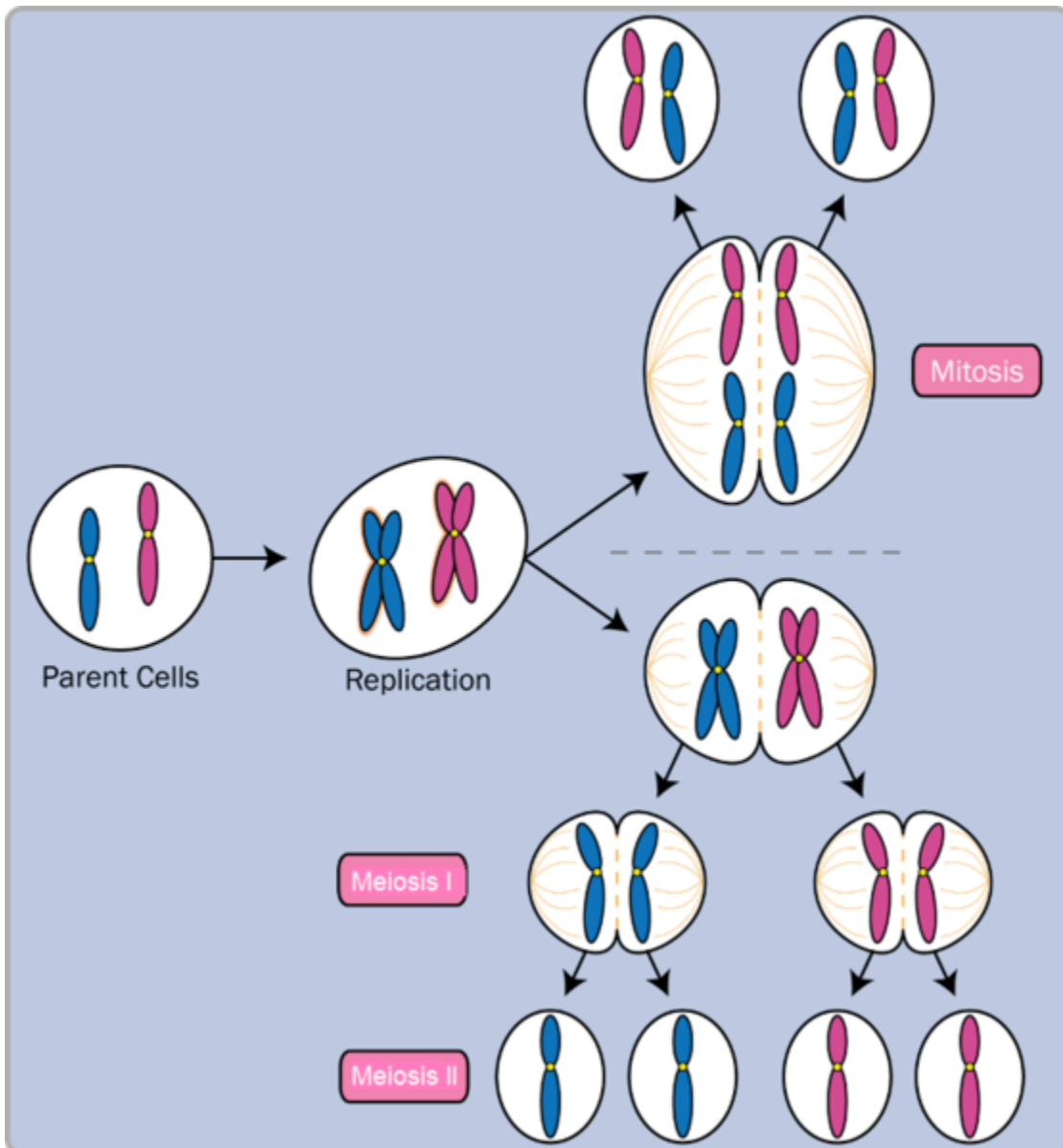
Figure 2.3: Mitosis and Meiosis. (Image by Community College Consortium for Bioscience Credentials is licensed under CC BY 3.0)

Given the number of genes present and the unpredictability of the meiosis process, the likelihood of having offspring that are genetically identical (and not twins) is one in trillions (Gould & Keeton, 1997, as cited in as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

Of the 23 pairs of chromosomes created at conception, 22 pairs are similar in length. These are called autosomes. The remaining pair, or **sex chromosomes**, may differ in length. It is the Y chromosome that determines sex.  If the Y chromosome is present, the child will be genetically male. If the Y chromosome is absent, the child will be genetically female (Lally & Valentine-French, 2019).

Here is an image (called a karyogram) of what the 23 pairs of chromosomes look like. Notice the differences between the sex chromosomes in female (XX) and male (XY).
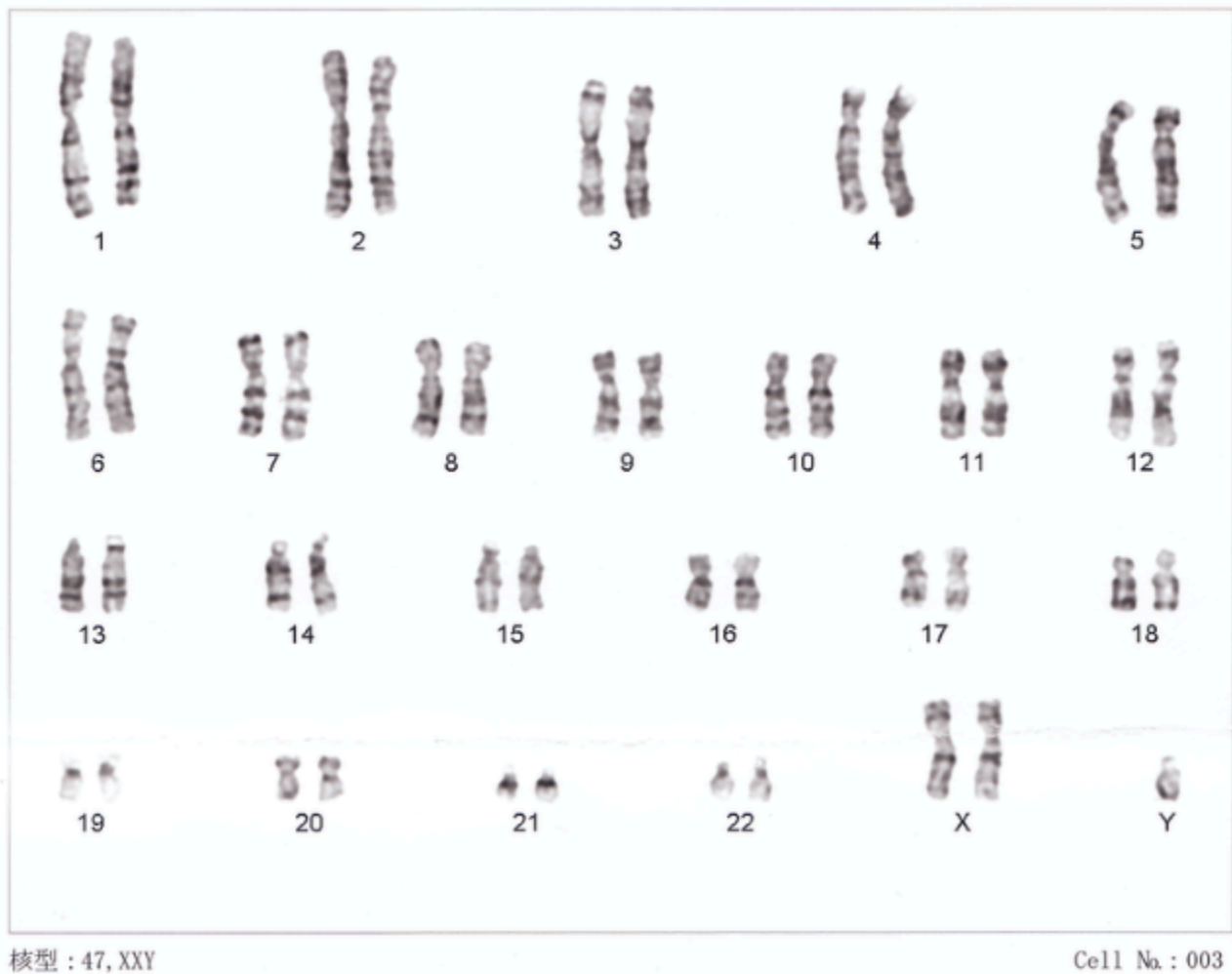


Figure 2.4: The 23 pairs of chromosomes. (Image by Nami-ja is in the public domain)

## GENOTYPES, PHENOTYPES & PATTERNS ON INHERITANCE

The word **genotype** refers to the sum total of all the genes a person inherits. The word **phenotype** refers to the features that are actually expressed. Look in the mirror. What do you see, your genotype or your phenotype? What determines whether or not genes are expressed?

Because genes are inherited in pairs on the chromosomes, we may receive either the same version of a gene

from our mother and father, that is, be **homozygous** for that characteristic the gene influences. If we receive a different version of the gene from each parent, that is referred to as **heterozygous.**

In the homozygous situation we will display that characteristic. It is in the heterozygous condition that it becomes clear that not all genes are created equal. Some genes are **dominant**, meaning they express themselves in the phenotype even when paired with a different version of the gene, while their silent partner is called recessive. **Recessive** genes express themselves only when paired with a similar version gene. Geneticists refer to different versions of a gene as alleles. Some dominant traits include having facial dimples, curly hair, normal vision, and dark hair. Some recessive traits include red hair, being nearsighted, and straight hair.

Most characteristics are not the result of a single gene; they are **polygenic**, meaning they are the result of several genes. In addition, the dominant and recessive patterns described above are usually not that simple either. Sometimes the dominant gene does not completely suppress the recessive gene; this is called incomplete dominance (Lally & Valentine-French, 2019).

## GENETIC DISORDERS

Most of the known genetic disorders are dominant gene-linked.

**Recessive gene disorders**, such as cystic fibrosis and sickle-cell anemia, are less common but may actually claim more lives because they are less likely to be detected as people are unaware that they are carriers of the disease.

Some genetic disorders are **sex-linked;** the defective gene is found on the X-chromosome. Males have only one X chromosome so are at greater risk for sex-linked disorders due to a recessive gene such as hemophilia, color-blindness, and baldness. For females to be affected by recessive genetic defects, they need to inherit the recessive gene on both X-chromosomes. But if the defective gene is dominant, females are equally at risk.

**Recessive Disorders (Homozygous):** The individual inherits a gene change from both parents. If the gene is inherited from just one parent, the person is a carrier and does not have the condition.

| Disorder | Description | Incidence |
|---|---|---|
| Sickle Cell Disease (SCD) | A condition in which the red blood cells in the body are shaped like a sickle (like the letter C) and affect the ability of the blood to transport oxygen. | 1 in 500 Black births<br>1 in 36,000 Hispanic births<br>1 in 2,500 babies born in Canada |
| Cystic Fibrosis (CF) | A condition that affects breathing and digestion due to thick mucus building up in the body, especially the lungs and digestive system. In CF, the mucus is thicker than normal and sticky. | 1 in 3,600 live births in Canada |
| Phenylketonuria (PKU) | A metabolic disorder in which the individual cannot metabolize phenylalanine, an amino acid. Left untreated, intellectual deficits occur. PKU is easily detected and is treated with a special diet. | 1 in 12,000 births in Canada |
| Tay Sachs Disease | Caused by an enzyme deficiency resulting in the accumulation of lipids in the nerves cells of the brain. This accumulation results in progressive damage to the cells and a decrease in cognitive and physical development. Death typically occurs by age five. | 1 in 320,000 births in the general population<br>1 in 30 people of Ashkenazi Jewish descent is a carrier<br>1 in 20 people of French-Canadian descent is a carrier |
| Albinism | When the individual lacks melanin and processes little to no pigment in the skin, hair, and eyes. Vision problems can also occur. | 1 in every 17,000 – 20,000 people in North America and Europe |

Table 2.2: Recessive Disorders (Homozygous) (Lally & Valentine-French, 2019).

**Autosomal Dominant Disorders (Heterozygous):** In order to have the disorder, the individual only needs to inherit the gene change from one parent.

| Disorder | Description | Incidence |
|---|---|---|
| Huntington's Disease | A condition that affects the individual's nervous system. Nerve cells become damaged, causing various parts of the brain to deteriorate. The disease affects movement, behavior and cognition. It is fatal, and occurs at midlife. | 1 in 10,000 |
| Tourette Syndrome | A tic disorder which results in uncontrollable motor and vocal tics as well as body jerking | 1 in 250 |
| Achondroplasia | The most common form of disproportionate short stature. The individual has abnormal bone growth resulting in short stature, disproportionately short arms and legs, short fingers, a large head, and specific facial features. | 1 in 15,000-40,000 |

Table 2.3 : Autosomal Dominant Disorders (Heterozygous) (Lally & Valentine-French, 2019).

**Sex-Linked Disorders:** When the X chromosome carries the mutated gene, the disorder is referred to as an X-linked disorder. Males are more affected than females because they possess only one X chromosome without an additional X chromosome to counter the harmful gene.

| Disorder | Description | Incidence |
|---|---|---|
| Fragile X Syndrome | Occurs when the body cannot make enough of a protein it needs for the brain to grow and problems with learning and behavior can occur. Fragile X syndrome is caused from an abnormality in the X chromosome, which then breaks. If a female has a fragile X, her second X chromosome usually is healthy, but males with fragile X don't have a second healthy X chromosome. This is why symptoms of Fragile X usually are more serious in males. | 1 in 4000 males<br>1 in 8000 females |
| Hemophilia | Occurs when there are problems in blood clotting causing both internal and external bleeding. Hemophilia is more common in males than females. The two most common types are hemophilia A and hemophilia B. | Hemophilia A: leas than 1 in 10,000 people in Canada<br>Hemophilia B: 1 in 50,000 people in Canada |
| Duchenne Muscular Dystrophy | A weakening of the muscles resulting in an inability to move, wasting away, and possible death. This form of muscular dystrophy affects males almost exclusively. | 1 in 3500 Male live births |

Table 2.4:  Sex-Linked Disorders (Lally & Valentine-French, 2019).

**Chromosomal Abnormalities:** A chromosomal abnormality occurs when a child inherits too many or two few chromosomes. Some gametes do not divide evenly when they are forming. Therefore, some cells have more than 46 chromosomes. In fact, it is believed that close to half of all zygotes have an odd number of chromosomes. Most of these zygotes fail to develop and are spontaneously aborted by the mother's body (Lally & Valentine-French, 2019, p.38).

**Autosomal Chromosome Disorders:** The individual inherits too many or two few chromosomes.

| Disorder | Description |
|---|---|
| Down Syndrome/ Trisomy 21 | Caused by an extra chromosome 21 and includes a combination of birth defects. Affected individuals have some degree of intellectual disability, characteristic facial features, often heart defects, and other health problems. The severity varies greatly among affected individuals. In Canada, approximately 1 in every 781 babies is born with Down Syndrome While the risk of having a baby with Down Syndrome increases with the mother's age, half of babies born with Down Syndrome are born to mothers under 35 years of age. (Reference: Canadian Down Syndrome Society). |
| Trisomy 9 Mosaicism | Caused by having an extra chromosome 9 in some cells. The severity of effects relates to the proportion of cells with extra chromosomes. The effects include fetal growth restriction resulting in low birth weight and multiple anomalies, including facial, cardiac, musculoskeletal, genital, kidney, and respiratory abnormalities. |
| Trisomy 13 | Caused by an extra chromosome 13. Affected individuals have multiple birth defects and generally die in the first weeks or months of life. |
| Trisomy 18 | Caused by an extra chromosome 18 and the affected individual also has multiple birth defects and early death. |

Table 2.5: Autosomal Chromosomal Disorders[Trisomy 9 Mosaicism Diagnosed In Utero by Hironori Takahashi, Satoshi Hayashi, Yumiko Miura, Keiko Tsukamoto, Rika Kosaki, Yushi Itoh, and Haruhiko Sago is licensed under CC BY 3.0; Lifespan Development: A Psychological Perspective (page 39) by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0

Figure 2.5: Infant boy with Trisomy 9 Mosaicism. (Image by Ashley Onken used with permission)

Figure 2.6: Girl with XXX Syndrome. (Image is in the public domain)

**Sex-linked Chromosome Disorders:** When the abnormality is on 23rd pair, the result is a sex-linked chromosomal abnormality. This happens when a person has less than or more than two sex chromosomes (Lally & Valentine-French, 2019, p. 38).

| Disorder | Description |
| --- | --- |
| Turner Syndrome (XO) | Caused when all or part of one of the X chromosomes is lost before or soon after conception due to a random event. The resulting zygote has an XO composition. Turner Syndrome affects cognitive functioning and sexual maturation in females. Infertility and a short stature may be noted. |
| Klinefelter Syndrome (XXY) | Caused when an extra X chromosome is present in the cells of a male due to a random event. The Y chromosome stimulates the growth of male genitalia, but the additional X chromosome inhibits this development. The male can have some breast development, infertility, and low levels of testosterone. |
| XXY Syndrome | Caused when an extra Y chromosome is present in the cells of a male. There are few symptoms. They may include being taller than average, acne, and an increased risk of learning problems. The person is generally otherwise normal, including normal fertility. |
| Triple X Syndrome (XXX) | Caused when an extra X chromosome is present in the cells of a female. It may result in being taller than average, learning difficulties, decreased muscle tone, seizures, and kidney problems. |

Table 2.6:  Sex-Linked Chromosomal Disorders]XYY Syndrome by Wikipedia is licensed under CC BY-SA 3.0; Triple X Syndrome by Wikipedia is licensed under CC BY-SA 3.0; Lifespan Development: A Psychological Perspective (page 39) by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0

**Triple Screening in Pregnancy:** The triple screen blood test is one type of genetic screening test. It measures alpha-fetoprotein, human chorionic gonadotropin and unconjugated estriol. An abnormal test result is not a

diagnosis, only an indication that the baby might be at higher risk for some birth defects. Additional testing is usually required, such as an ultrasound or amniocentesis.

## PRENATAL DEVELOPMENT

Now we turn our attention to prenatal development which is divided into three periods: The germinal period, the embryonic period, and the fetal period. The following is an overview of some of the changes that take place during each period.

### The Germinal Period

The **germinal period** (about 14 days in length) lasts from **conception** to implantation of the fertilized egg in the lining of the uterus. At ejaculation millions of sperm are released into the vagina, but only a few reach the egg and typically only one fertilizes the egg. Once a single sperm has entered the wall of the egg, the wall becomes hard and prevents other sperm from entering. After the sperm has entered the egg, the tail of the sperm breaks off and the head of the sperm, containing the genetic information from the father, unites with the nucleus of the egg. It is typically fertilized in the top section of the fallopian tube and continues its journey to the uterus. As a result, a new cell is formed. This cell, containing the combined genetic information from both parents, is referred to as a **zygote**.



Figure 2.7: Sperm and ovum at conception. (Image is in the public domain)

During this time, the organism begins cell division through mitosis. After five days of mitosis there are 100 cells, which is now called a blastocyst. The blastocyst consists of both an inner and outer group of cells. The inner group of cells, or embryonic disk will become the embryo, while the outer group of cells, or trophoblast, becomes the support system which nourishes the developing organism. This stage ends when the blastocyst fully implants into the uterine wall (U.S. National Library of Medicine, 2015, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).
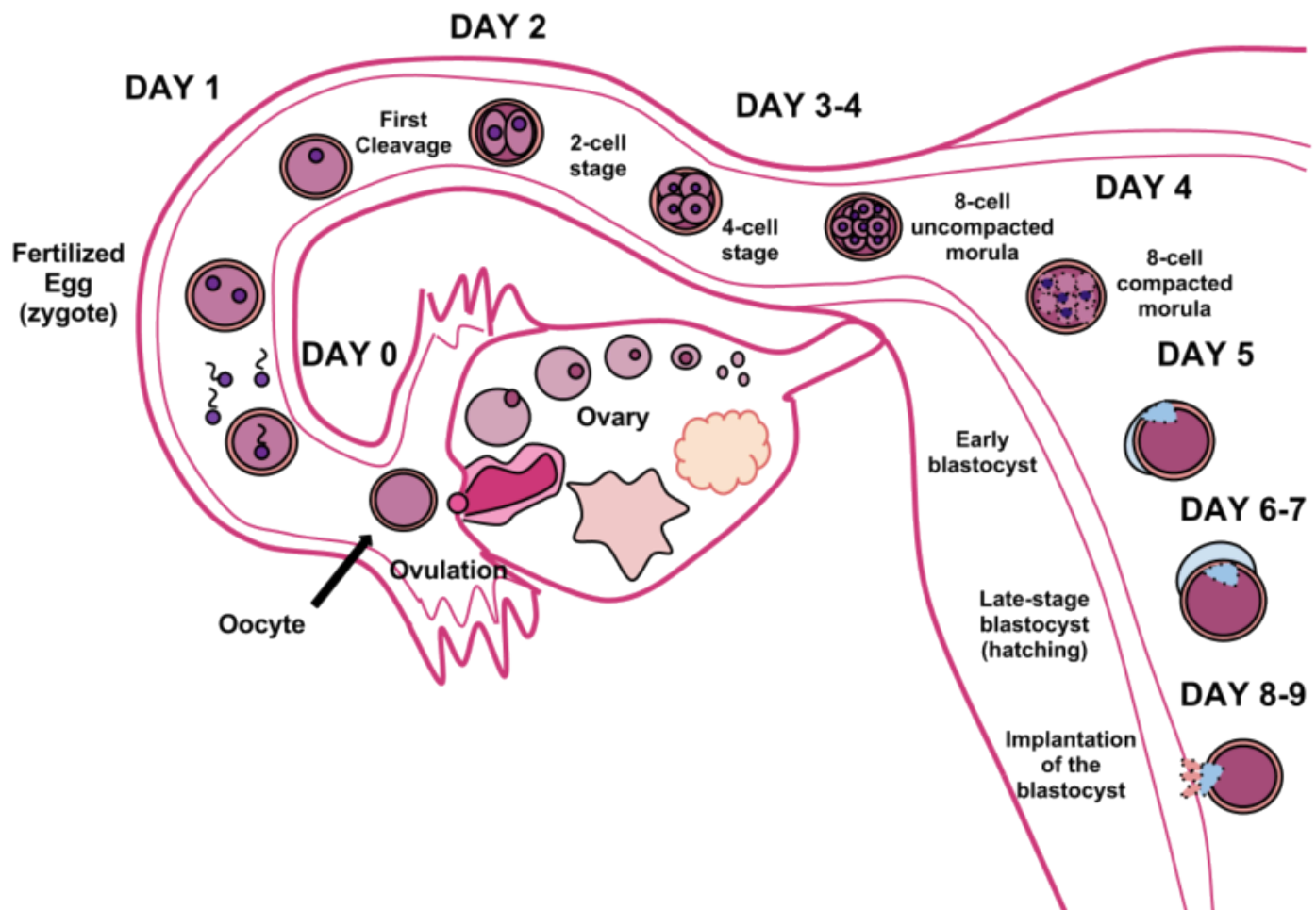
Figure 2.8: The cycle of fertilization. (Image by Ttrue12 is licensed under CC BY-SA 3.0)

Mitosis is a fragile process and fewer than one half of all zygotes survive beyond the first two weeks (Hall, 2004). Some of the reasons for this include: the egg and sperm do not join properly, thus their genetic material does not combine, there is too little or damaged genetic material, the zygote does not replicate, or the blastocyst does not implant into the uterine wall. The figure above illustrates the journey of the ova from its release to its fertilization, cell duplication, and implantation into the uterine lining (Lally & Valentine-French, 2019,p. 42-43).

## The Embryonic Period

Starting the third week, the blastocyst has implanted in the uterine wall. Upon implantation this multi-cellular organism is called an **embryo**. Now blood vessels grow forming the placenta. The **placenta** is a structure connected to the uterus that provides nourishment and oxygen from the mother to the developing embryo via the umbilical cord.

During this period, cells continue to **differentiate**. Growth during prenatal development occurs in two major directions: from head to tail called **cephalocaudal development** and from the midline outward referred to as **proximodistal development**. This means that those structures nearest the head develop before those nearest the feet and those structures nearest the torso develop before those away from the center of the body (such as hands and fingers). You will see that this pattern continues after birth.

The head develops in the fourth week and the precursor to the heart begins to pulse. In the early stages of the embryonic period, gills and a tail are apparent. However, by the end of this stage they disappear and the organism takes on a more human appearance.



Figure 2.9: A human embryo. (Image by Anatomist90 is licensed under CC BY-SA 3.0)

About 20 percent of organisms fail during the embryonic period, usually due to gross chromosomal abnormalities, often before the mother even knows that they are pregnant. It is during this stage that the major structures of the body are taking form, making the embryonic period the time when the organism is most vulnerable to the greatest amount of damage if exposed to harmful substances. Prospective mothers are not often aware of the risks they introduce to the developing embryo during this time. The embryo is approximately 1 inch in length and weighs about 4 grams at the end of eight weeks. The embryo can move and respond to touch at this time. (Lally & Valentine-French, 2019, p. 43).

## The Fetal Period

From the ninth week until birth (which is forty weeks for a full-term pregnancy), the organism is referred to as a **fetus**. During this stage, the major structures are continuing to develop. By the third month, the fetus has all its body parts including external genitalia. The fetus is about 3 inches long and weighs about 28 grams. In the

following weeks, the fetus will develop hair, nails, teeth and the excretory and digestive systems will continue to develop.



Figure 2.10: A human fetus. (Image by lunar caustic is licensed under CC BY-SA 2.0)

During the 4th – 6th months, the eyes become more sensitive to light and hearing develops. The respiratory system continues to develop, and reflexes such as sucking, swallowing and hiccupping, develop during the 5th month. Cycles of sleep and wakefulness are present at this time as well. The first chance of survival outside the womb, known as the age of viability is reached at about 24 weeks (Morgan, Goldenberg, & Schulkin, 2008, as cited in Paris, Ricardo, Raymond & Johnson, 2021). The majority of the neurons in the brain have developed by 24 weeks, although they are still rudimentary, and the glial or nurse cells that support neurons continue to grow. At 24 weeks the fetus can feel pain (Royal College of Obstetricians and Gynecologists, 1997, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

Between the 7th – 9th months, the fetus is primarily preparing for birth. It is exercising its muscles and its lungs begin to expand and contract. The fetus gains about 5 pounds and 7 inches during this last trimester of pregnancy, and during the 8th month a layer of fat develops under the skin. This layer of fat serves as insulation and helps the baby regulate body temperature after birth.

At around 36 weeks the fetus is almost ready for birth. It weighs about 6 pounds and is about 18.5 inches long. By week 37 all of the fetus's organ systems are developed enough that it could survive outside the mother's uterus without many of the risks associated with premature birth. The fetus continues to gain weight and grow in length until approximately 40 weeks. By then the fetus has very little room to move around and birth becomes imminent. The progression through the stages is shown in the following figure (Lally & Valentine-French, 2019, p. 44).

**9 weeks**
Fetal stage begins

**12 weeks**
Sex organs differentiate

**16 weeks**
Fingers and toes develop

**20 weeks**
Hearing begins

**24 weeks**
Lungs begin to develop

**28 weeks**
Brain grows rapidly

**32 weeks**
Bones fully develop

**36 weeks**
Muscles fully develop

**40 weeks**
Full-term development

Figure 2.11: The development of a fetus. (Image by CNX Psychology is licensed under CC BY 4.0)

## MONOZYGOTIC AND DIZYGOTIC TWINS

Monozygotic or identical twins occur when a fertilized egg splits apart in the first two weeks of development. The result is the creation of two separate identical offspring. That is, they possess the same genotype and often the same phenotype. About one-third of twins are monozygotic twins.

Sometimes, however, two eggs or ova are released and fertilized by two separate sperm. The result is dizygotic or fraternal twins. These two individuals share the amount of genetic material as would any two children from the same mother and father. In other words, they possess a different genotype and phenotype.

Older mothers are more likely to have dizygotic twins than are younger mothers, and couples who use fertility drugs are also more likely to give birth to twins (Lally & Valentine-French, 2019, p. 36) .



Figure 2.12: Monozygotic Twins. (Image is in the public domain)



Figure 2.13: Dizygotic Twins. (Image by Jennifer Paris used with permission)

## TERATOGENS

Good prenatal care is essential to protect against maternal and fetal/infant mortality and birth complications. The embryo and fetus are most at risk for some of the most severe problems during the first three months of development. Unfortunately, this is a time at which many mothers are unaware that they are pregnant. Today, we know many of the factors that can jeopardize the health of the developing child. **Teratogens** are environmental factors that can contribute to birth defects, and include some maternal diseases, pollutants, drugs and alcohol. The study of these factors that contribute to birth defects is called teratology.

Factors influencing prenatal risks: There are several considerations in determining the type and amount of damage that might result from exposure to a particular teratogen (Berger, 2005, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). These include:

- **The timing of the exposure:** Structures in the body are vulnerable to the most severe damage when they are forming. If a substance is introduced during a particular structure's critical period (time of development), the damage to that structure may be greater. For example, the ears and arms reach their

critical periods at about 6 weeks after conception. If a mother exposes the embryo to certain substances during this period, the arms and ears may be malformed. (see figure below)

- **The amount of exposure:** Some substances are not harmful unless the amounts reach a certain level. The critical level depends in part on the size and metabolism of the mother.

- **The number of teratogens:** Fetuses exposed to multiple teratogens typically have more problems than those exposed to only one.

- **Genetics:** Genetic makeup also plays a role on the impact a particular teratogen might have on the child. This is suggested by fraternal twins exposed to the same prenatal environment, but they do not experience the same teratogenic effects. The genetic makeup of the mother can also have an effect; some mothers may be more resistant to teratogenic effects than others.

- **Being male or female:** Males are more likely to experience damage due to teratogens than are females. It is believed that the Y chromosome, which contains fewer genes than the X, may have an impact (Lally & Valentine-French, 2019, p. 46/47).
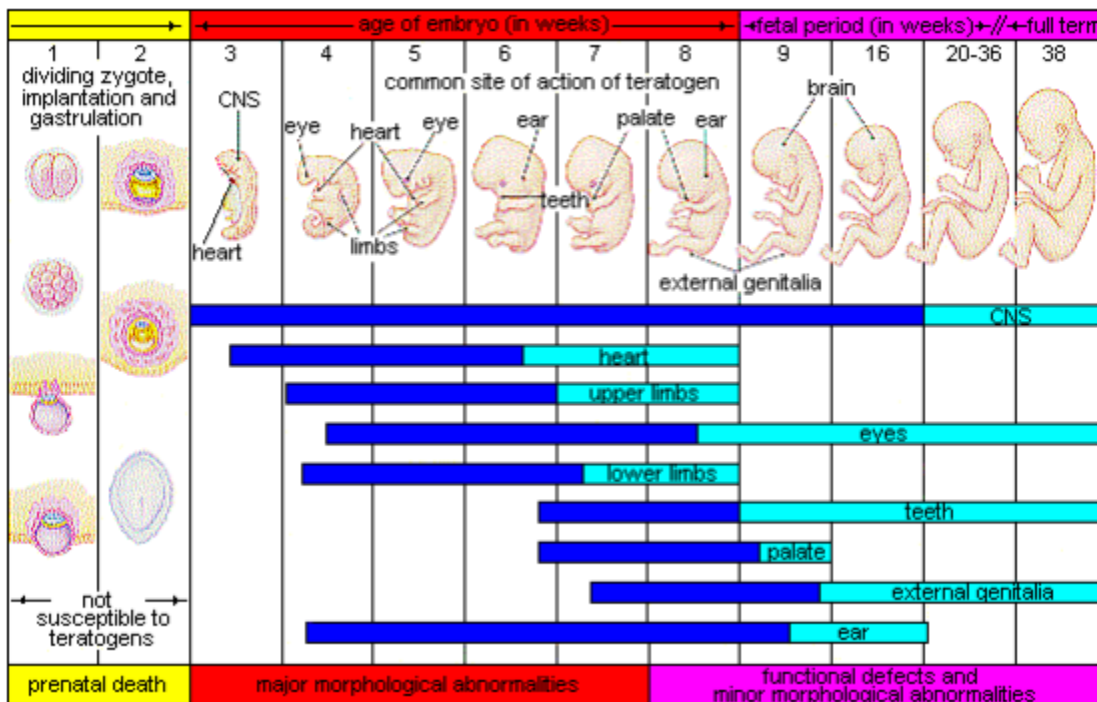


Figure 2.14: The development of an embryo into a fetus. (Image by Laura Overstreet is licensed under CC BY-NC-SA 3.0)

There are four categories of teratogens:

1. **Physical teratogens:** These could be saunas, hot tubs, or infections that raise a pregnant woman's body temperature to 102 degrees Fahrenheit or higher. This is associated with neural tube defects, spontaneous abortions, and various cardiovascular abnormalities.

2. **Metabolic conditions affecting pregnant females:** Metabolic conditions are abnormalities in the chemical process of producing energy from food, and thereby affect the development and function of

the body. If a pregnant woman is malnourished, then her fetus likely lacks the nutrients essential for its development. These include: malnutrition, diabetes, and thyroid disorders.

3. **Infections:** Different maternal infections, including rubella virus, herpes simplex virus, and syphilis can cause congenital abnormalities in fetuses.

4. **Drugs and chemicals:** When pregnant females ingest or absorb these, they may cause a variety of different effects based on specific agent, amount of exposure, and timing. This category includes: radiation, heavy metals (including lead), insecticides and herbicides, prescription and over the counter drugs, illicit and recreational drugs, alcohol, cigarettes, nicotine, caffeine, and even some vitamins (Tantibanchachai, 2014).

While there are many, many potential teratogens, the following tables look at the effects of some different types of teratogens. The risks of exposure vary based on lifestyle and health. The effects may vary greatly depending on the factors mentioned previously. Protection and prevention will vary based on the method of exposure.

| Teratogen | Potential Effects |
|---|---|
| Caffeine | Moderate amounts of caffeine (200 mg or around 12 ounces of coffee) appear to be safe during pregnancy. Some studies have shown a link between higher amounts of caffeine and miscarriage and preterm birth. Staying healthy and safe by OWH is in the public domain |
| Tobacco | Tobacco use has been associated with low birth weight, placenta previa, preterm delivery, fetal growth restriction, sudden infant death syndrome, cleft lip or palate, and later health problems (such as high blood pressure and diabetes).Chapter 3: Prenatal Development – Environmental Risks references Psyc 200 Lifespan Psychology by Laura Overstreet, which is licensed under CC BY 4.0; Staying healthy and safe by OWH is in the public domain |
| Alcohol | There is no safe amount of alcohol a woman can drink while pregnant. Alcohol can slow down the baby's growth, affect the baby's brain, and cause birth defects, and may results in fetal alcohol spectrum disorder (FASD). The effects can be mild to severe. Children born with a severe form of FASD can have abnormal facial features, severe learning disabilities, behavioral problems, and other problems.Staying healthy and safe by OWH is in the public domain |
| Cocaine | Cocaine use has connected with low birth weight, stillbirths, spontaneous abortion, placental abruption, premature birth, miscarriage, and neonatal abstinence syndrome (fetal addiction leads the newborn to experiences withdrawal).Chapter 3: Prenatal Development – Environmental Risks references Psyc 200 Lifespan Psychology by Laura Overstreet, which is licensed under CC BY 4.0; Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal- products.aspx[ |
| Marijuana | No amount of marijuana has been proven safe to use during pregnancy. Heavy use has been associated with brain damage, premature birth, and stillbirth.Chapter 3: Prenatal Development – Environmental Risks references Psyc 200 Lifespan Psychology by Laura Overstreet, which is licensed under CC BY 4.0; Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal- products.aspx |
| Heroin | Using heroin during pregnancy can cause birth defects, placental abruption, premature birth, low birthweight, neonatal abstinence syndrome, still birth, and sudden infant death syndrome.Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal-products.aspx |
| Over-the-Counter (OTC) medication | Some OTC medications are safe to use during pregnancy and others may cause health problems during pregnancy. Pregnant women should consult their health care provider before using OTC medications.Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal- products.aspx[ |
| Prescription drugs | Some prescription drugs can cause birth defects that change the shape or function of one or more parts of the body that can affect overall health. Pregnant women should consult their health care provider before discontinuing or starting new medications.Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal- products.aspx[ |
| Herbal or dietary supplements | Except for some vitamins, little is known about using herbal or dietary supplements while pregnant. Most often there are no good studies to show if the herb can cause harm to you or your baby. Also, some herbs that are safe when used in small amounts as food might be harmful when used in large amounts as medicines.Chapter 3: Prenatal Development – Environmental Risks references Psyc 200 Lifespan Psychology by Laura Overstreet, which is licensed under CC BY 4.0[ |

Table 2.7 – Drugs as Teratogens (Paris, Ricardo, Raymond, & Johnson, 2021)

| Teratogen | Potential Effects |
|---|---|
| Lead> | Exposure to high levels of lead before and during pregnancy can lead to high blood pressure, problems with fetal brain and nervous system development, premature birth, low birthweight, and miscarriage.Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal-products.aspx[ |
| Mercury | Exposure to mercury in the womb can cause brain damage and hearing and vision problems.Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal- products.aspx[ |
| Radiation | Exposure to radiation during pregnancy (especially between 2 and 18 weeks of pregnancy) can slow growth, cause birth defects, affect brain development, cause cancer, and cause miscarriage.Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal- products.aspx[ |
| Solvents | These chemicals include degreasers, paint thinners, stain and varnish removers, paints, and more Maternal inhalation of solvents can cause fetal exposure than may cause miscarriage, slow fetal growth, premature birth, and birth defects.Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal- products.aspx[ |
| Radon | Radon is a radioactive gas naturally found in the environment when uranium in soil and rock breaks down. Radon is odorlous, invisible and tasteless. Research in this area is limited, but one unreplicated research study in 2016 concluded there is an association between residential radon levels and the occurrence of cleft lip and cystic hygroma (a fluid-filled sac that results from a blockage in the lymphatic system). (Langlois, P. H., Lee, M., Lupo, P. I., Rahbar, M. H., & Cortez, R. K. (2016). Residential radon and birth defects: A population-based assessment. Birth defects research. Part A, Clinical and molecular teratology, 106(1), 5–15. https://doi.org/10.1002/bdra.23369) |

Table 2.8 – Environmental Teratogens (Paris, Ricardo, Raymond, & Johnson, 2021)

| Teratogen | Potential Effects |
|---|---|
| Rubella | Congenital infection (becoming infected while in the womb) can damage the development of the eyes, ears, heart, and brain and result in deafness.Chapter 3: Prenatal Development – Environmental Risks references Psyc 200 Lifespan Psychology by Laura Overstreet, which is licensed under CC BY 4.0[ |
| Zika | Congenital infection can cause microcephaly and other severe brain abnormalities.Protocols on prenatal care for pregnant women with Zika infection and children with microcephaly: nutritional approach by Rachel de Sá Barreto Luna Callou Cruz, Malaquias Batista Filho, Maria de Fátima Costa Caminha, and Edvaldo da Silva Souza is licensed under CC BY 4.0[ |
| Varicella (chicken pox) | Congenital infection can cause a severe form of the infection affecting the eyes, limbs, skin, and central nervous system.Congenital Varicella syndrome by WikiDoc is licensed under CC BY-SA 3.0[ |
| Sexually transmitted infections | Infections such as HIV, gonorrhea, syphilis, and chlamydia can be passed from the mother during pregnancy and/or delivery.Chapter 3: Prenatal Development – Environmental Risks references Psyc 200 Lifespan Psychology by Laura Overstreet, which is licensed under CC BY 4.0[ |
| Listeria | Pregnant women are more susceptible to this food-borne illness. Congenital infection can cause miscarriage, stillbirth, premature labor, and neonatal sepsis.https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2860824/[ |

Table 2.9 – Maternal Infections as Teratogens (as cited in Paris, Ricardo, Raymond, & Johnson, 2021)

| Teratogen | Potential Effects |
|---|---|
| Toxoplamosis | This parasite can be passed through cat feces and undercooked meat (especially pork, lamb, or deer meat). If the fetus is infected it can cause miscarriage, stillbirth, hydrocephalus, macro or microcephalus, vision issues, and damage to the nervous system.Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal- products.aspx[ |
| Lymphocytic choriomeningitis | This virus carried by rodents including mice, hamsters, and guinea pigs. If an infected mother passes it to her fetus it can cause issues with brain development, long-term neurological and/or visual impairment, and higher mortality rates after birth.Prescription drugs, over-the-counter drugs, supplements and herbal products (n.d.). Retrieved from: https://www.marchofdimes.org/pregnancy/prescription-drugs-over-the-counter-drugs-supplements-and-herbal- products.aspx[ |

Table 2.10: Teratogens from Animals/Pets (as cited in Paris, Ricardo, Raymond, & Johnson, 2021)

## MATERNAL FACTORS

There are additional factors that affect the outcome of pregnancy for both mother and child. Let's look at these next.

## Mothers over 35

Most women over 35 who become pregnant are in good health and have healthy pregnancies. However, according to the March of Dimes (2016d, as cited in as cited in Paris, Ricardo, Raymond, & Johnson, 2021), women over age 35 are more likely to have an increased risk of:

- Fertility problems
- High blood pressure
- Diabetes
- Miscarriages
- Placenta Previa
- Cesarean section
- Premature birth
- Stillbirth
- A baby with a genetic disorder or other birth defects

Because are born with all of their eggs, environmental teratogens can affect the quality of the eggs as women get older. Also, a woman's reproductive system ages which can adversely affect the pregnancy. Some women over 35 choose special prenatal screening tests, such as a maternal blood screening, to determine if there are any health risks for the baby.

Although there are medical concerns associated with having a child later in life, there are also many positive consequences to being a more mature parent. Older parents are more confident, less stressed, and typically married, providing family stability. Their children perform better on math and reading tests, and they are less prone to injuries or emotional troubles (Albert, 2013, as cited in as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Women who delay pregnancy either by choice or because of challenges with conceiving are often better educated and have healthier lifestyles. According to Gregory (2007, as cited in as cited in Paris, Ricardo, Raymond, & Johnson, 2021), older women are more stable, demonstrate a stronger family focus, possess greater self-confidence, and have more money. Having a child later in one's career equals overall higher wages. In fact, for every year a woman delays motherhood, she makes 9% more in lifetime earnings. Lastly, women who delay having children actually live longer.

## Paternal  Factors

Male fertility is also affected by age. The quality of semen starts to decline after the age of 35. Sperm motility also declines with age. Genetic defects in sperm increase with age. These defects have been associated with: decreased fertility, increased risk of miscarriage, increase risk of some birth defects and increase risk of stillbirth (Gurevich, 2020).

## Teenage Pregnancy

A teenage mother is at a greater risk for having pregnancy complications including anemia, and high blood pressure.

These risks are even greater for those under age 15. Infants born to teenage mothers have a higher risk for

being premature and having low birthweight or other serious health problems. Premature and low birthweight babies may have organs that are not fully developed which can result in breathing problems, bleeding in the brain, vision loss, serious intestinal problems, and higher likelihood of dying. Reasons for these health issues include that teenagers are the least likely of all age groups to get early and regular prenatal care and they may engage in negative behaviours including eating unhealthy food, smoking, drinking alcohol, and taking drugs.

## Experiences of Indigenous Women

An extensive literature review conducted in 2016 concluded that availability of healthcare resources, healthcare services' consideration of socio-economic or lifestyle barriers to health, and the impact of colonization on interactions with healthcare providers were main factors that impacted Indigenous women's maternal health experiences. Medical evacuation was often due to limited maternity care options available in remote communities, and was associated with emotional, physical, and financial stress. The review highlighted the importance of consistent health policies and practices for maternal health in Canada and providing culturally safe and patient-centered maternity healthcare services within indigenous communities (Kolahdooz, Launier, Nader, Yi, Baker, McHugh, Vallianatos & Sharma, 2016).

Kenhteke Midwives on the Tyendinaga Mohawk Territory in Canada is an example of culturally appropriate maternal and newborn care that "sustains our way of life by birthing our children in the hands of our own people, on our land, using our language, traditions, culture and traditional medicines" (Kenhteke Midwives, 2017).

## Gestational Diabetes

Gestational diabetes can occur if the body cannot produce enough insulin to adapt to the effects of a growing fetus and changing hormone levels. The cells become resistant to the action of insulin and, in turn, the pancreas cannot secrete enough insulin to counterbalance the effect of these hormones.

In Canada, between 3% and 20% of pregnant women develop gestational diabetes, depending on their risk factors. While the rate for all pregnancies is roughly 2%-4%, the rate in First Nations women has been reported to be between 8% and 18% (Diabetes Canada, 2022). Research by Dyck et al. (2002, as cited in First Nations Centre, National Aboriginal Health Organization, 2009) concluded that First Nations ancestry is an independent risk factor; that is, even when a woman has none of the other risk factors for developing gestational diabetes, if she is of First Nations ancestry, she is more likely to develop gestational diabetes. The researchers concluded that the reasons for this were unclear.

Figure 2.15: A gestational diabetes kit. (Image by Jessica Merz is licensed under CC BY 2.0)

Most pregnant women have their glucose level tested between 24 to 28 weeks of pregnancy. Gestational diabetes usually goes away after the mother gives birth, but it might indicate a risk for developing diabetes later in life. If untreated, gestational diabetes can cause premature birth, stillbirth, the baby having breathing problems at birth, jaundice, or low blood sugar. Babies born to mothers with gestational diabetes can also be considerably heavier (more than 9 pounds) making the labor and birth process more difficult. For expectant mothers, untreated gestational diabetes can cause preeclampsia (high blood pressure and signs that the liver and kidneys may not be working properly) discussed later in the chapter.

Risk factors for gestational diabetes include age (being over age 25), being overweight or gaining too much weight during pregnancy, family history of diabetes, having had gestational diabetes with a prior pregnancy, and race and ethnicity. In addition to women with First Nation ancestry, African-American, Native American, Hispanic, Asian, or Pacific Islander have a higher risk. Eating healthy, exercising regularly and maintaining a healthy weight during pregnancy can reduce the chance of developing gestational diabetes. If these actions are unsuccessful at controlling blood sugar levels, insulin may be required. Women who already have diabetes and become pregnant need to attend all their prenatal care visits, and follow the same advice as those for women with gestational diabetes as the risk of preeclampsia, premature birth, birth defects, and stillbirth are the same.

## High Blood Pressure (Hypertension)

Hypertension is a condition in which the pressure against the wall of the arteries becomes too high. There are two types of high blood pressure during pregnancy, gestational and chronic. Gestational hypertension only occurs during pregnancy and goes away after birth. Chronic high blood pressure refers to women who already had hypertension before the pregnancy or to those who developed it during pregnancy and it did not go away after birth.



Figure 2.16: A woman having her blood pressure taken. (Image by rawpixel on Unsplash)

According to the March of Dimes (2015, as cited in Paris, Ricardo, Raymond, & Johnson, 2021), about 8 in every 100 pregnant women have high blood pressure. High blood pressure during pregnancy can cause premature birth and low birth weight (under five and a half pounds), placental abruption, and mothers can develop preeclampsia.

## Rh Disease

Rh is a protein found in the blood. Most people are Rh positive, meaning they have this protein. Some people are Rh negative, meaning this protein is absent. Mothers who are Rh negative are at risk of having a baby with a form of anemia called Rh disease (March of Dimes, 2009). A father who is Rh-positive and mother who is Rh-negative can conceive a baby who is Rh-positive. Some of the fetus's blood cells may get into the mother's bloodstream and the immune system is unable to recognize the Rh factor.

The immune system starts to produce antibodies to fight off what it thinks is a foreign invader. Once the body produces immunity, the antibodies can cross the placenta and start to destroy the red blood cells of the developing fetus. As this process takes time (longer than 9 months), often the first Rh positive baby is not harmed, but as the mother's body will continue to produce antibodies to the Rh factor across their lifetime, subsequent pregnancies can pose greater risk for an Rh positive baby. When there is Rh incompatibility (Rh negative woman

conceives an Rh positive baby), RhoGAM, a manufactured antibody, is given to the pregnant woman at 28 weeks and again after delivery. This prevents the mother from developing the antibodies that would attack the baby's blood cells in the event that the blood crosses the placenta. In the newborn, Rh disease can lead to jaundice, anemia, heart failure, brain damage and death.

## Weight Gain during Pregnancy

According to March of Dimes (2016, as cited in Paris, Ricardo, Raymond, & Johnson, 2021), during pregnancy most women need only an additional 300 calories per day to aid in the growth of the fetus. Gaining too little or too much weight during pregnancy can be harmful. Women who gain too little may have a baby who is low-birth weight, while those who gain too much are likely to have a premature or large baby. There is also a greater risk for the mother developing preeclampsia and diabetes, which can cause further problems during the pregnancy.

The table below shows the healthy weight gain during pregnancy. Putting on the weight slowly is best. Mothers who are concerned about their weight gain should talk to their health care provider.

| If you were a healthy weight before pregnancy: | If you were underweight before pregnancy:> | If you were overweight before pregnancy: | If you were obese before pregnancy: |
|---|---|---|---|
| Gain 25-35 pounds | Gain 28-30 pounds | Gain 12-25 pounds | 11-20 pounds |
| 1-4½ pounds in the 1st trimester 1 pound per week in the 2nd and 3rd trimesters | 1-4½ pounds in the 1st trimester A little more than 1 pound per week | 1-4½ pounds in the 1st trimester A little more than ½ pound per week in 2nd and 3rd | 1-4½ pounds in the 1st trimester A little more than ½ pound per week in 2nd and 3rd |
| Mothers of twins or higher order multiples need to gain more in each category. | thereafter | trimesters | trimesters |

Table 2.10 – Weight Gain during Pregnancy (Paris, Ricardo, Raymond & Johnson, 2021).

## STRESS

Feeling stressed is common during pregnancy, but high levels of stress can cause complications including having a premature baby or a low-birthweight baby. Babies born early or too small are at an increased risk for health problems. Stress-related hormones may cause these complications by affecting a woman's immune systems resulting in an infection and premature birth. Additionally, some women deal with stress by smoking, drinking alcohol, or taking drugs, which can lead to problems in the pregnancy. High levels of stress in pregnancy have also been correlated with problems in the baby's brain development and immune system functioning, as well as childhood problems such as trouble paying attention and being afraid (March of Dimes, 2012, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## DEPRESSION

Depression is a significant medical condition in which feelings of sadness, worthlessness, guilt, and fatigue interfere with one's daily functioning. According to the Mayo Clinic, about 7% of women experience depression during pregnancy (Mayo Clinic, 2022).

Women who have experienced depression previously are more likely to have depression during pregnancy. Consequences of depression include the baby being born premature, having a low birth weight, being more irritable, less active, less attentive, and having fewer facial expressions.

About 13% of pregnant women take an antidepressant during pregnancy. It is important that women taking antidepressants during pregnancy discuss the medication with a health care provider as some medications can cause harm to the developing organism.

## PATERNAL IMPACT

The age of fathers at the time of conception is also an important factor in health risks for children. According to Nippoldt (2015, as cited in Paris, Ricardo, Raymond, & Johnson, 2021), offspring of men over 40 face an increased risk of miscarriages, autism, birth defects, achondroplasia (bone growth disorder) and schizophrenia. These increased health risks are thought to be due to accumulated chromosomal aberrations and mutations during the maturation of sperm cells in older men (Bray, Gunnell, & Smith, 2006, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). However, like older women, the overall risks are small.

In addition, men are more likely than women to work in occupations where hazardous chemicals, many of which have teratogenic effects or may cause genetic mutations, are used (Cordier, 2008, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). These may include petrochemicals, lead, and pesticides that can cause abnormal sperm and lead to miscarriages or diseases. Men are also more likely to be a source of second hand smoke for their developing offspring. As noted earlier, smoking by either the mother or around the mother can hinder prenatal development (Lally & Valentine-French, 2019. p.52).



Figure 2.17: A USDA employee pouring hazardous chemicals into a storage container. (Image by USDA is in the public domain)

## Prenatal Assessment

A number of assessments are suggested to women as part of their routine prenatal care to find conditions that may increase the risk of complications for the mother and fetus (Eisenberg, Murkoff, & Hathaway, 1996, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). These can include blood and urine analyses and screening and diagnostic tests for birth defects.

Figure 2.18: A woman receiving an ultrasound. (Creator: Keith Brofsky | Credit: Getty Images)

**Ultrasound** is one of the main screening tests done in combination with blood tests. The ultrasound is a test in which sound waves are used to examine the fetus. There are two general types. Transvaginal ultrasounds are used in early pregnancy, while transabdominal ultrasounds are more common and used after 10 weeks of pregnancy (typically, 16 to 20 weeks).

Ultrasounds are used to check the fetus for defects or problems. It can also find out the age of the fetus, location of the placenta, fetal position, movement, breathing and heart rate, amount of amniotic fluid in the uterus, and number of fetuses. Most women have at least one ultrasound during pregnancy, but if problems are noted, additional ultrasounds may be recommended.

When diagnosis of a birth defect is necessary, ultrasounds help guide the more invasive diagnostic tests of amniocentesis and chorionic villus sampling. Amniocentesis is a procedure in which a needle is used to withdraw a small amount of amniotic fluid and cells from the sac surrounding the fetus and later tested.
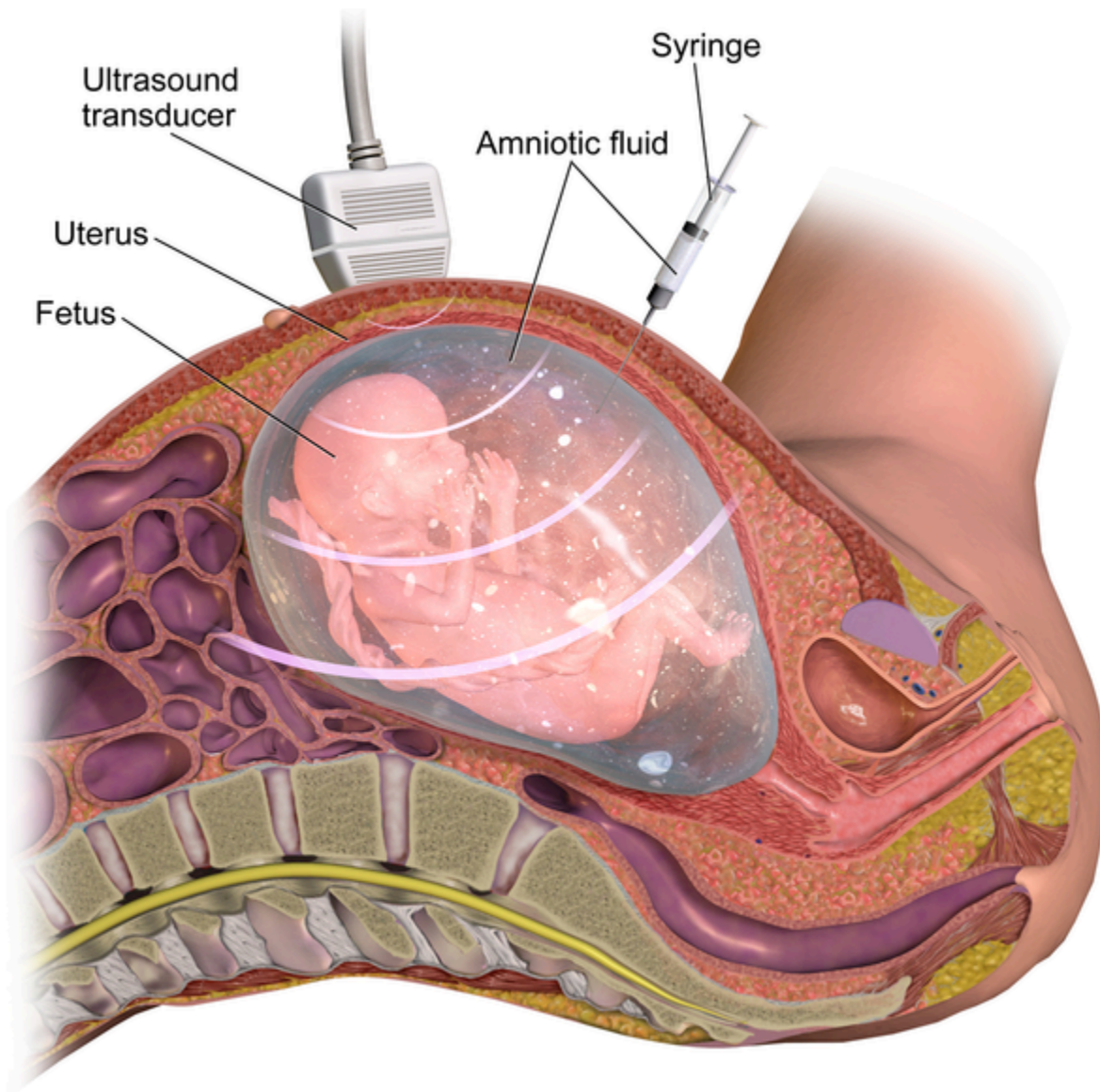
Figure 2.19: Amniocentesis. (Image by BruceBlaus is licensed under CC BY-SA 4.0)

**Chorionic Villus Sampling** is a procedure in which a small sample of cells is taken from the placenta and tested. Both amniocentesis and chorionic villus sampling have a risk of miscarriage, and consequently they are not done routinely (Lally & Valentine-French, 2019).

## SIDE EFFECTS OF PREGNANCY

There are a number of common side effects of pregnancy. Not everyone experiences all of these, nor to the same degree. In most cases, these side effects will not harm the developing fetus, but this is not to say that they are not potentially very uncomfortable for the mother. These side effects include nausea (particularly during the first 3-4 months of pregnancy as a result of higher levels of estrogen in the system), heartburn, gas, hemorrhoids, backache, leg cramps, insomnia, constipation, shortness of breath or varicose veins (as a result of carrying a heavy load on the abdomen).

But there are also serious complications of pregnancy which can pose health risks to mother and child and that often require hospitalization.

**Hyperemesis gravidarum** is characterized by severe nausea, vomiting, weight loss, and possibly dehydration. Signs and symptoms may also include vomiting many times a day and feeling faint. The exact causes of hyperemesis gravidarum are unknown. Risk factors include the first pregnancy, multiple pregnancy, obesity, prior or family history of HG, trophoblastic disorder, and a history of eating disorders. Treatment includes drinking fluids and a bland diet. Medication, intravenous fluids, and hospitalization may be required. Hyperemesis gravidarum is estimated to affect 0.3–2.0% of pregnant women. Those affected have a low risk of miscarriage but a higher risk of premature birth.

**Ectopic Pregnancy** occurs when the zygote becomes attached to the fallopian tube before reaching the uterus. The rate of ectopic pregnancy is about 2% in the general population (Canadian Medical Association Journal, 2005).

This number has been increasing because of the higher rates of pelvic inflammatory disease and Chlamydia (Carroll, 2007, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Abdominal pain, vaginal bleeding, nausea and fainting are symptoms of ectopic pregnancy.



Figure 2.20: An ectopic pregnancy. (Image by Takatakatakumi is licensed under CC BY-SA 3.0)

The Society of Obstetricians and Gynaecologists of Canada estimates that 15 to 20% of pregnancies end in a miscarriage. In many cases, a miscarriage is due to chromosomal abnormalities in the developing fetus, and this typically happens before the 12th week of pregnancy. Cramping and bleeding result and normal periods return after several months. Some women are more likely to have repeated miscarriages due to chromosomal, amniotic, or hormonal problems, but miscarriage can also be a result of defective sperm (Carrell et. al., 2003, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

**Preeclampsia**, also known as **Toxemia**, is characterized by a sharp rise in blood pressure, a leakage of protein into the urine as a result of kidney problems, and swelling of the hands, feet, and face during the third trimester of pregnancy. Preeclampsia is the most common complication of pregnancy. When preeclampsia causes seizures, the condition is known as eclampsia. Preeclampsia is also a leading cause of fetal complications, which include low birth weight, premature birth, and stillbirth. Treatment is typically bed rest and sometimes medication. If this treatment is ineffective, labor may be induced.

**Maternal Mortality:** According to to the World Health Organization (2017), approximately 800 women around the world died each day from preventable causes related to pregnancy and childbirth. Rates are highest in Sub-Saharan Africa and South Asia, although there has been a substantial decrease in these rates. The campaign to make childbirth safe for everyone has led to the development of clinics accessible to those living in more isolated areas and training more midwives to assist in childbirth (as cited in Lally & Valentine-French, 2019, p. 58).

## OPTIONS FOR BUILDING FAMILIES

There are numerous options to pursue parenthood and building families. Let's briefly explore some of these.

**Assisted Reproductive Technology:** Assisted reproductive technology (ART) is the technology used to achieve pregnancy in procedures such as fertility medication (to stimulate ovulation), surgical procedures, artificial insemination IUI), in vitro fertilization (IVF) and surrogacy. These options are available for people who are experiencing infertility or cannot conceive children naturally, which also includes single parents, and LGBTQIA2S+ couples (Fertilitypedia, n.d., as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

**Intrauterine insemination:** (IUI) as a type of artificial insemination involves the placement of sperm directly into the uterus at the time of ovulation, either in a natural menstrual cycle or following ovarian stimulation (Fertilitypedia, n.d., as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

**In vitro fertilization (IVF):** IVF generally starts with stimulating the ovaries to increase mature egg production. Most fertility medications are agents that stimulate the development of follicles in the ovary. Examples are gonadotropins and gonadotropin releasing hormone. After stimulation, the physician surgically extracts one or more eggs from the ovary, and unites them with sperm in a laboratory setting, with the intent of producing one or more embryos. Fertilization takes place outside the body, and the fertilized egg is reinserted into the woman's reproductive tract, in a procedure called embryo transfer (Fertilitypedia, n.d., as cited by Paris, Ricardo, Raymond, & Johnson, 2021).



Figure 2.21: The IVF process. (Image by Manu5 is licensed under CC BY-SA 4.0)

**Donor Gametes & Embryos:** People can also use sperm, ova (eggs), and embryos from donors in conjunction with assisted reproduction technology. In Canada, the Assisted Human Reproduction Act (2004) makes it illegal to sell or buy sperm, ova and embryos.

**Surrogacy:** In surrogacy, one woman (surrogate mother) carries a child for another person/s (commissioning person/couple), based on a legal agreement before conception requiring the child to be relinquished to the commissioning person/couple following birth. There are different types of surrogacy which relate to whether or not the ova used to conceive the child are their own (traditional surrogacy) or not (gestational surrogacy) (Fertilitypedia, n.d., as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

**Adoption:** People can also choose to pursue adoption to build their families (with or without experiencing infertility). Adoption can take place through the foster care system, privately, or through agencies. Adoptions can be domestic (within Canada) or international. And they can be open (with differing amounts of contact between biological/birth families and adoptive families) or closed.

**Family Built with Surrogacy** (Photo by Daryn Crawford used with permission)

Figure 2.22: This same-sex couple used a surrogate. (Photo by Daryn Crawford used with permission)

Figure 2.23: This single mother adopted her daughter. (Photo by Michaela Szidloski used with permission)

## Summary

In this chapter we looked at:

- Heredity, including genetic disorders and chromosomal abnormalities

- Conception

- The germinal, embryonic, and fetal stages of prenatal development

- Influences on prenatal development including teratogens and maternal and paternal factors

- Complications of pregnancy

- Infertility and options for building families

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## CHAPTER 3

# *Birth and the Newborn*

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**Chapter Objectives**

After this chapter, you should be able to:

- Compare and contrast different methods of childbirth preparation.
- Describe the stages of vaginal delivery.
- Explain why induction or Caesarean section may be necessary.
- Differentiate the common procedures for assessing the condition of the newborn.
- Examine problems newborns experience before, during, and after birth.

## INTRODUCTION

In this chapter we will explore childbirth and the early experiences of the newborn which includes having to regulate their own body temperature, breathe for themselves, and take in all of their nutrition through feeding.

After around 266 days of developing inside the womb (for a full-term pregnancy), comes the arduous process of childbirth. For many reasons, each pregnancy and delivery is unique and influenced by social and cultural factors as well as personal choices made about preparing for childbirth. Let's begin by exploring some of the approaches to childbirth.

## PREPARING FOR CHILDBIRTH

Prepared childbirth refers to being not only in good physical condition to help provide a healthy environment for the baby to develop, but also helping individuals to prepare to accept their new roles as parents. Additionally, parents can receive information and training that will assist them in delivery and life with the baby. The more future parents can learn about childbirth and the newborn, the better prepared they will be for the adjustment they must make to a new life.

## Approaches to Childbirth

### *Support for Culturally Safe Indigenous Birth*

Children born into their home community are more likely to develop a clear sense of identity, which helps to promote resilience and build strong community bonds. However, most Indigenous women are forced to travel to urban centres to give birth in settings that may not feel culturally secure. Care providers and administrators need to value and incorporate birth traditions, rituals, and ceremonies, provide different options for safe maternity care outside of major centres, and increase the number of Indigenous maternity care providers (e.g., midwives, doulas, birth workers).

Care providers may be well-meaning in their intentions to care for the Indigenous mother and their infant based on their professional training, but this has also resulted in birth being medicalized in Western ways with subsequent loss of traditional birth practices, ceremonies, and rituals for Indigenous families (National Aboriginal Council of Midwives, 2016, as cited in Exner-Pirot, Norbye and Butler, 2018). To offer quality maternity care to Indigenous mothers and their families, providers should work towards practicing cultural safety. Cultural safety addresses inequities arising from sociocultural factors and power differentials between service providers and those they care for; clinical practice without cultural safety contributes to the continued oppression of Indigenous peoples (Roy, 2014, as cited in Exner-Pirot, Norbye and Butler, 2018). Learning about different peoples and cultures is a key component of gaining cultural competence for care providers (Kirmayer, 2012; Tervalon & Murray-García, 1998, as cited in Exner-Pirot, Norbye and Butler, 2018). Therefore, increasing care provider understanding about traditional maternal and newborn Indigenous birthing practices and ceremonies is essential to promote cultural security for childbearing women (Exner-Pirot, Norbye and Butler, 2018).

| Method | Description |
|---|---|
| **The Lamaze Method** | The emphasis of this method is on teaching the woman to be in control in the process of delivery. It includes learning muscle relaxation, breathing through contractions, having a focal point (usually a picture to look at) during contractions and having a support person who goes through the training process with the mother and serves as a coach during delivery. |
| **The Leboyer Method** | This method involves giving birth in a quiet, dimly lit room and allowing the newborn to lie on the mother's stomach with the umbilical cord intact for several minutes while being given a warm bath. |
| **Dick-Read Method / Mongan Method / Hypnobirthing** | This method comes from the suggestion that the fear of childbirth increases tension and makes the process of childbearing more painful. It emphasizes the use of relaxation and proper breathing with contractions as well as family support and education. |
| **Bradley Method** | "The Bradley Method focuses on preparing the mother for a natural childbirth coached by her partner. They learn techniques to reduce the perception of pain and stay relaxed. The emphasis is on being prepared for an unassisted vaginal birth without medication." Oberg, Erica (n.d.). Childbirth Delivery Methods and Types. Retrieved from https://www.medicinenet.com/7_childbirth_and_delivery_methods/article.htm#childbirth_and_delivery_methods_and_types_facts. |
| **Alexander Technique** | This is a technique that can be used during childbirth that involves training to stop habitual reactions to pain, such as tensing muscles and increase conscious awareness and control over posture and movement. This involves being able to move freely and stay upright during labor and using body positioning that is beneficial to the labor process. Machover, Ilana. (n.d.). The Alexander Technique in Natural Childbirth. Retrieved from https://www.alexandertechnique.com/articles/ childbirth/. |
| **Waterbirth** | Involves immersion in warm water. Proponents believe this method is safe and provides many benefits for both mother and infant, including pain relief and a less traumatic birth experience for the baby. However, critics argue that the procedure introduces unnecessary risks to the infant such as infection and water inhalation. Water Birth by Wikidoc is licensed under CC BY-SA 3.0 |
| **Lotus Birth** | Or umbilical cord nonseverance – UCNS, is the practice of leaving the umbilical cord uncut after childbirth so that the baby is left attached to the placenta until the cord naturally separates at the umbilicus. This usually occurs within 3–10 days after birth. The practice is performed mainly for spiritual purposes of the parents, including for the perceived spiritual connection between placenta and newborn. Lotus Birth by Wikipedia is licensed under CC BY-SA 3.0 |
| **Silent Birth** | Sometimes known as quiet birth, is a birthing procedure  in which "everyone attending the birth should refrain from spoken words as much as possible." Silent Birth by Wikipedia is licensed under CC BY-SA 3.0 |
| **Medicated Childbirth** | Health care providers can provide pain relief during labor with different types of medication, including epidurals, spinal blocks, combined spinal-epidurals, and systemic and local analgesia. There are benefits and side effects of each.Epidural and Spinal Anesthesia Use During Labor: 27-state Reporting Area, 2008 by Michelle J.K. Osterman and Joyce A. Martin is in the public domain |

Table 3.1: Birthing Methods (Lally & Valentine French, 2019, as cited in Paris, Ricardo, Raymond, & Johnson, 2021)



Figure 3.1: Expectant parents in a childbirth preparation class. (Image by liz.schrenk is licensed under CC BY-NC-ND 2.0)

## Choosing Location of Childbirth & Who Will Deliver

The vast majority of births occur in a hospital setting. However, approximately 1% of births in Canada in 2019 were in locations other than a hospital (Statistics Canada, 2020). Live births and fetal deaths (stillbirths), by place of birth (hospital or non-hospital) Women who are at low risk for birth complications can successfully deliver at home. More than half (67%) of home deliveries are by certified nurse midwives. In 1994, Ontario became the first province in Canada to regulate midwifery. "Midwifery is a health care profession distinct from nursing. Midwives specialize in providing primary care to women during pregnancy, labour, birth and postpartum in relation to low risk prenatal, intrapartum and postnatal care." (Mah, 2013). In order to practice midwifery in Ontario, midwives must be registered with the College of Midwives of Ontario, and must adhere to the by-laws of the College. There are exemptions to these legal requirements for aboriginal midwives and healers. In Ontario, services of midwives are funded by the provincial government and there is no fee charged to the expectant mother.

## CHILDBIRTH

### Onset of Labor

Childbirth typically occurs within a week of a woman's due date, unless the woman is pregnant with more than one fetus, which usually causes an early labor early. As a pregnancy progresses into its final weeks, several physiological changes occur in response to hormones that trigger labor.

A common sign that labor is beginning is the so-called "bloody show." During pregnancy, a plug of mucus accumulates in the cervical canal, blocking the entrance to the uterus. Approximately 1–2 days prior to the onset of true labor, this plug loosens and is expelled, along with a small amount of blood.

As labor nears, the mothers' pituitary gland produces oxytocin. This begins to stimulate stronger, more painful uterine contractions, which—in a positive feedback loop—stimulate the secretion of prostaglandins from fetal membranes. Like oxytocin, prostaglandins also enhance uterine contractile strength. The fetal pituitary gland also secretes oxytocin, which increases prostaglandins even further.

And the stretching of the cervix by a full-term fetus in the head-down position is regarded as a stimulant to uterine contractions. Combined, these stimulate true labor (Biga, Dawson, Harwell, Hopkins, Kaufmann, LeMaster, Matern, Morrison-Graham, Quick, & Runyeon, n.d., as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

### Stages of Birth for Vaginal Delivery: The First Stage

Uterine contractions signify that the first stage of labor has begun. These contractions may initially last about 30 seconds and be spaced 15 to 20 minutes apart. These increase in duration and frequency to more than a minute in length and about 3 to 4 minutes apart. Typically, doctors and midwives advise that they be called when contractions are coming about every 5 minutes. Some women experience false labor or Braxton-Hicks Contractions, especially with the first child. These may come and go. They tend to diminish when the mother begins walking around. Real labor pains or contractions tend to increase with walking. In one out of 8 pregnancies, the amniotic sac or water in which the fetus is suspended may break before labor begins. In such cases, the physician or midwife may induce labor with the use of medication if it does not begin on its own within twenty-four hours in order to reduce the risk of infection. Normally this sac does not rupture until the later stages of labor.

The first stage of labor is typically the longest. During this stage the cervix or opening to the uterus dilates to 10 centimeters or just under 4 inches. This may take around 12-16 hours for first children or about 6-9 hours for women who have previously given birth. It is during this stage that strategies learned in childbirth classes such as breathing techniques and finding visual focal points can be of great benefit to the labour process. Labor may also begin with a discharge of blood or amniotic fluid.
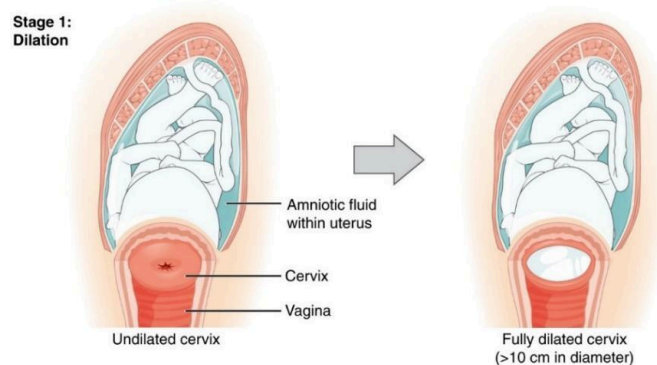


Figure 3.2: Early Cervical dilation. (Image by OpenStax is licensed under CC BY 3.0)

## The Second Stage

The passage of the baby through the birth canal is the second stage of labor. This stage takes about 10-40 minutes. Contractions usually come about every 2-3 minutes. The mother pushes and relaxes as coached by the birthing team. Typically, the head is delivered first. The baby is then rotated so that one shoulder can come through and then the other shoulder. The rest of the baby quickly passes through. At this stage, an episiotomy, or incision made in the tissue between the vaginal opening and anus, may be performed to avoid tearing the tissue of the back of the vaginal opening (Mayo Clinic, 2016, as cited in Lally & Valentine French, 2019). The baby's mouth and nose are suctioned out. The umbilical cord is clamped and cut (Lally & Valentine French, 2019, p.60, as cited in Paris, Ricardo, Raymond, & Johnson, 2021)
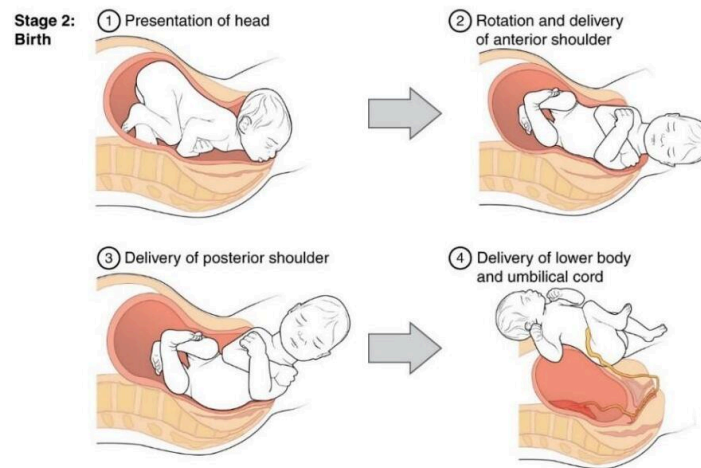


Figure 3.3: Full dilation and expulsion of the newborn.(Image by OpenStax is licensed under CC BY 3.0)

## The Third Stage

The third and final stage of labor is relatively painless. During this stage, the placenta or afterbirth is delivered. This is typically within 20 minutes after delivery. If an episiotomy was performed it is stitched up during this stage (Lally & Valentine French, 2019, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).



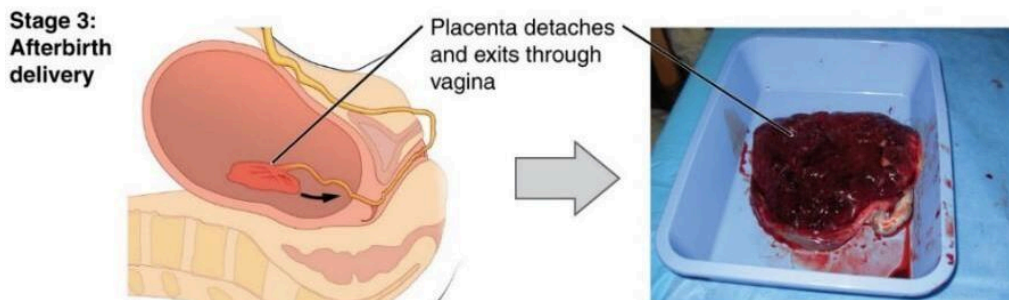Figure 3.4: Delivery of the placenta and associated fetal membranes. (Image by OpenStax is licensed under CC BY 3.0)

Indigenous Perspective

Once the baby is born there is a ceremony performed that will connect the baby to mother earth (connection to the land and all creation).

## Additional Considerations

An epidural block is a regional analgesic that can be used during labor and alleviates most pain in the lower body without slowing labor. The epidural block can be used throughout labor and has little to no effect on the baby. Medication is injected into a small space outside the spinal cord in the lower back. It takes 10 to 20 minutes for the medication to take effect. An epidural block with stronger medications, such as anesthetics, can be used shortly before a Cesarean Section or if a vaginal birth requires the use of forceps or vacuum extraction (Lally & Valentine French, 2019, p. 60). In Canada, epidural rates have risen from 53.2% in 2006/07 to 57.8% in 2015/16 (Public Health Agency of Canada,2018).

  Women giving birth can also receive other pain medications (although medications given through injection can have negative side effects on the baby). In emergency situations (such as the need for a C-section), women may be given general anesthesia. They can also choose not to utilize any pain medications. That is often referred to as **natural childbirth**.

Figure 3.5: Natural childbirth. (Image by U.S. Army Alaska is licensed under CC BY 2.0)

Women can also use alternate positions (including standing, squatting, being on hands and knees, and using a birthing stool) and labouring, and even delivering in tubs of warm water to help relieve the pain of childbirth.

## Medical Interventions in Childbirth

Sometimes women cannot go into labor on their own and/or deliver vaginally. Let's look at induction of labor and cesarean sections.

Sometimes a baby's arrival may need to be induced before labor begins naturally. **Induction of labor** may be recommended for a variety of reasons when there is a concern for the health of the mother or baby. For example:

- The mother is approaching two weeks beyond the due date and labor has not started naturally

- The mother's water has broken, but contractions have not begun

- There is an infection in the mother's uterus

- The baby has stopped growing at the expected pace

- There is not enough amniotic fluid surrounding the baby

- The placenta peels away, either partially or completely, from the inner wall of the uterus before delivery

- The mother has a medical condition that might put them or the baby at risk, such as high blood pressure or diabetes (Mayo Clinic, 2014, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

A cesarean section (C-section) is surgery to deliver the baby by being removed through the mother's abdomen. In Canada, cesarean births have risen from 17.6% in 1995/96 to 27.9% in 2015/16 (Public Health Agency of Canada, 2018). Most C-sections are done when problems occur during delivery unexpectedly.
These can include:

- Health problems in the mother

- Signs of distress in the baby

- Not enough room for the baby to go through the vagina

- The position of the baby, such as a breech presentation where the head is not in the downward position or a transverse lie, where the baby may be sideways.

Figure 3.6: A woman receiving a C-section. (Image by Tammra M is licensed under CC BY 2.0)

Figure 3.7: A baby being delivered by C-section. (Image by Patricia Prudente on Unsplash)

C-sections are also more common among women carrying more than one baby. Although the surgery is relatively safe for mother and baby, it is considered major surgery and carries health risks. Additionally, it also takes longer to recover from a C-section than from vaginal birth. After healing, the incision may leave a weak spot in the wall of the uterus. This could cause problems with an attempted vaginal birth later. In the past, doctors were hesitant to allow a vaginal birth after a C-section. However, now more than half of women who have a C-section go on to have a vaginal birth later (Lally & Valentine-French, 2019, p. 61). This is referred to as a **Vaginal Birth After Cesarean (VBAC)**.

## THE NEWBORN



Figure 3.8: A new mother holding her newborn. (Image by the U.S. Air Force is in the public domain)

**Assessing the Newborn**

The Apgar assessment is conducted one minute and five minutes after birth. This is a very quick way to assess the newborn's overall condition. Five measures are assessed: Heart rate, respiration, muscle tone (assessed by touching the baby's palm), reflex response (the Babinski reflex is tested), and colour. A score of 0 to 2 is given on each feature examined. An Apgar of 5 or less is cause for concern. The second Apgar should indicate improvement with a higher score (Lally & Valentine-French, 2019, p. 63).

Figure 3.9: The Apgar assessment. (Image by Event Medicine Group)

Another way to assess the condition of the newborn is the Neonatal Behavioral Assessment Scale (NBAS). The baby's motor development, muscle tone, and stress response are assessed. This tool has been used around the world to further assess the newborn, especially those with low Apgar scores, and to make comparisons of infants in different cultures (Brazelton & Nugent, 1995, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

Newborns are also routinely screened for different conditions. Within the first 24 to 48 hours after birth, babies born in hospitals undergo a simple heel stick and a few drops of blood are collected on a special paper card. Providers test those dried blood spots for a variety of different congenital disorders, or conditions that are present when the baby is born.

Figure 3.10: A medical professional performing the heel stick test. (Image by the U.S. Air Force is in the public domain) Newborns are also screened for hearing disorders and certain serious heart problems using methods other than dried blood spots.Newborn Screening is in the public domain ; Newborn Screening Program (NBS) by the California Department of Public Health is in the public domain

In Ontario all newborns in hospital and community settings have a universal hearing screening administered as part of the Infant Hearing Program. This screening identifies infants who should have more in-depth testing for hearing loss as early as possible.

Most babies will pass the newborn hearing screening which means their hearing is fine at this time (Government of Ontario, 2021).

## Complications with the Newborn

### *Anoxia*

Anoxia is a temporary lack of oxygen to the brain. Difficulty during delivery may lead to anoxia which can result in brain damage or in severe cases, death. Babies who suffer both low birth weight and anoxia are more likely to suffer learning disabilities later in life as well.

### *Low Birth Weight*

A child is considered low birth weight if they weigh less than 2500 grams (5.5lbs). In 2017, 6.5% of babies born in Canada weighed less than 2500 grams. There are regional differences in this statistic. For example, in the Northwest Territories, 5.9% of babies were low birth weight. Ontario was slightly above the national figure at 6.7%. In Nunavut, 7.8% of babies were low birth weight (Statistics Canada, 2018a).

A low birth weight baby has difficulty maintaining adequate body temperature because it lacks the fat that would otherwise provide insulation. Such a baby is also at more risk for infection.

Very low birth weight babies (2 pounds or less) have an increased risk of developing cerebral palsy. Many causes of low birth weight are preventable with proper prenatal care.

## Preterm

A newborn might also have a low birth weight if it is born at less than 37 weeks gestation, which qualifies it as a preterm baby (CDC, 2015, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Early birth can be triggered by anything that disrupts the mother's system. For instance, vaginal infections can lead to premature birth because such infection causes the mother to release anti-inflammatory chemicals which, in turn, can trigger contractions. Smoking and the use of other teratogens can lead to preterm birth. A significant consequence of preterm birth includes respiratory distress syndrome, which is characterized by weak and irregular breathing (see the image below). Premature babies often cannot yet regulate their own temperature or feed by nursing or bottle. They may struggle to regulate their heart rate effectively and may experience jaundice. They often require care in the Neonatal Intensive Care Unit (NICU) until they are as healthy as a full-term baby.
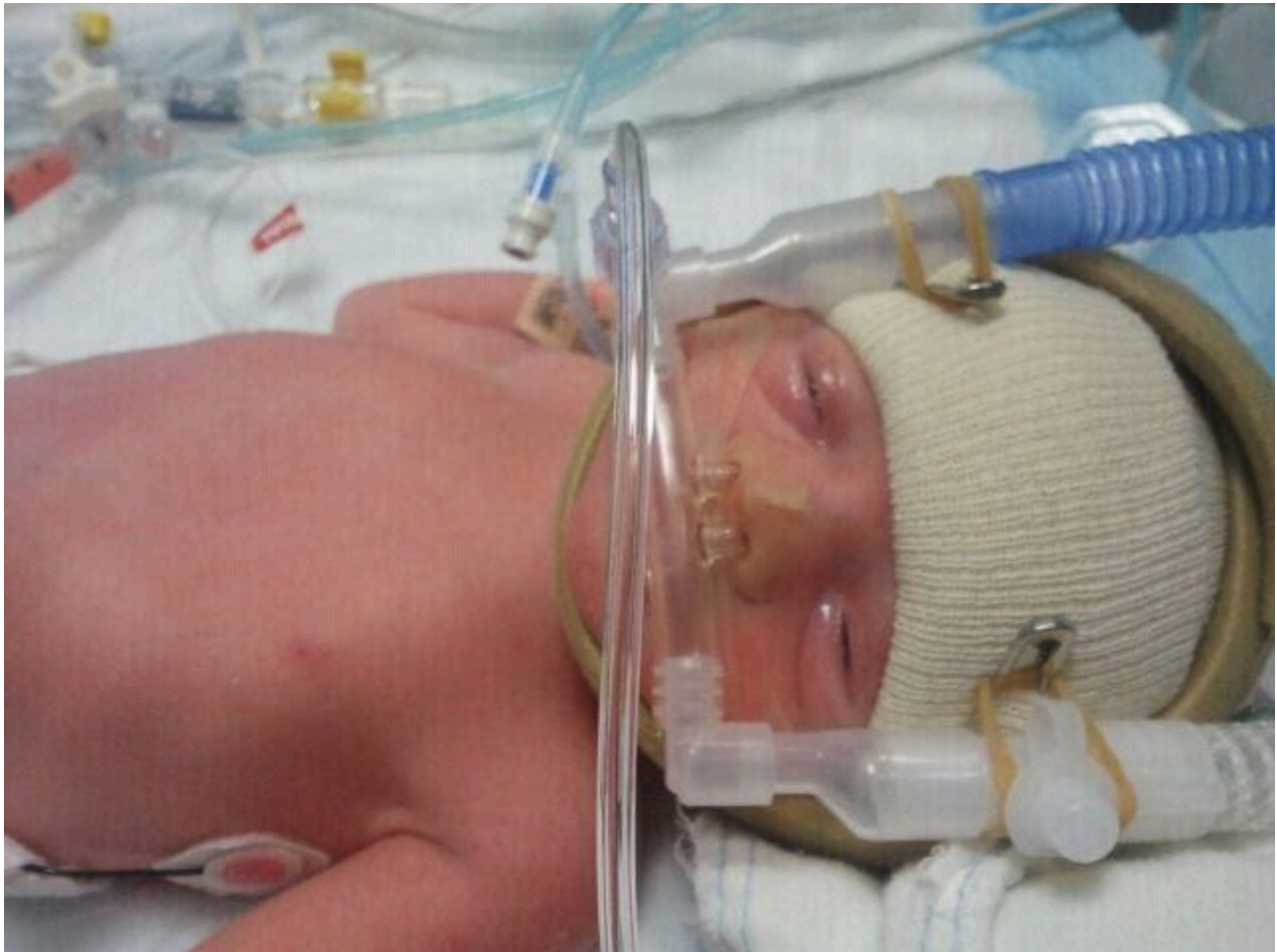


Figure 3.11: a premature baby on CPAP (continuous positive airway pressure)in the NICU. (Photo by Jennifer Paris used with permission)

## Small-for-Date Infants

Infants that have birth weights that are below expectation based on their gestational age are referred to as small-for-date. These infants may be full term or preterm (see image below), but still weigh less than 90% of all babies

of the same gestational age. This is a very serious situation for newborns as their growth was adversely affected. Regev et al. (2003, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) found that small-for-date infants died at rates more than four times higher than other infants.



Figure 3.12: This baby was born at 32 weeks and only weighed 2 pounds and 15 ounces. (Photo by Jennifer Paris used with permission)

## Postmature

When babies are not born by 42 weeks gestation, or two weeks after their due date, they are considered overdue or postmature. There are some concerns about how long the placenta can function and most doctors will consider induction for overdue babies.

## Stillborn

When a fetus (unborn baby) dies while still inside the mother (after 20-24 weeks gestation) or dies during delivery (childbirth), it is said that the delivered baby is stillborn. The causes of many stillbirths are unknown, even when special tests are done to learn the cause. Possible causes include: nicotine, alcohol, or drugs taken by the mother during pregnancy, physical trauma, radiation poisoning, Rh disease, and umbilical cord problems.

In 2019, there were 3,191 stillbirths in Canada. This is a fetal death rate of 8.6 per 1,000 total births (Statistics Canada, 2020).

## Characteristics of Newborns

*Size*

The average newborn in the United States weighs about 7.5 pounds and is about 20 inches in length. In Canada the average weight is  3,530 grams or 7 pounds, 12.5 ounces. Read this article in The Star for more info.

    For the first few days of life, infants typically lose about 5 percent of their body weight as they eliminate waste and get used to feeding. This often goes unnoticed by most parents, but can be cause for concern for those who have a smaller infant. This weight loss is temporary, however, and is followed by a rapid period of growth.



Figure 3.13: A newborn being weighed. (Image by Trei Brundrett is licensed under CC BY-SA 2.0)

*Body Proportions*

The head initially makes up about 50 percent of our entire length when we are developing in the womb. At birth, the head makes up about 25 percent of our length (think about how much of your length would be head if the proportions were still the same!).
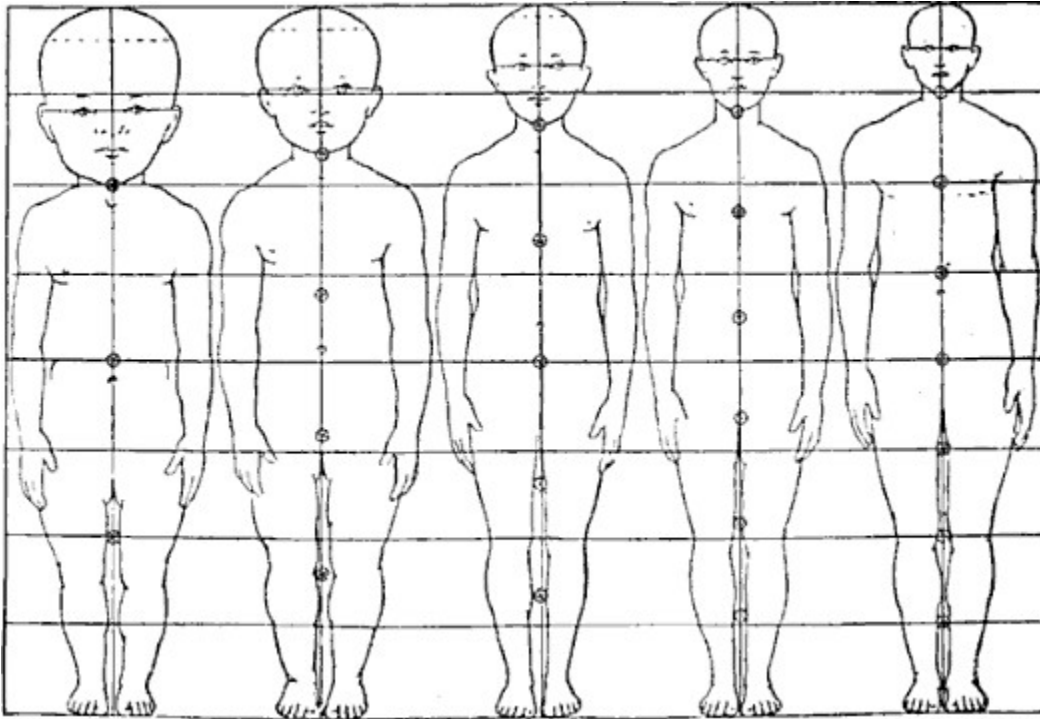
Figure 3.14: Body proportions from infancy to adulthood.(Image is in the public domain)

### Brain Development

Some of the most dramatic physical changes that occur during this period are in the brain. At birth, the brain is about 25 percent its adult weight and this is not true for any other part of the body. While most of the brain's 100 to 200 billion neurons are present at birth, they are not fully mature. During the next several years dendrites or connections between neurons will undergo a period of transient exuberance or temporary dramatic growth.

Appearance at Birth

During labor and birth, the infant's skull changes shape to fit through the birth canal, sometimes causing the child to be born with a misshapen or elongated head. It will usually return to normal on its own within a few days or weeks.

Some newborns have a fine, downy body hair called **lanugo**. It may be particularly noticeable on the back, shoulders, forehead, ears and face of premature infants. Lanugo disappears within a few weeks. Likewise, not all infants are born with lush heads of hair. Some may be nearly bald while others may have very fine, almost invisible hair. Some babies are even born with a full head of hair. Amongst fair-skinned parents, this fine hair may be blond, even if the parents are not.

Immediately after birth, a newborn's skin is often grayish to dusky blue in colour. As soon as the newborn begins to breathe, usually within a minute or two, the skin's colour returns to its normal tone. Newborns are wet, covered in streaks of blood, and coated with a white substance known as **vernix**, which is thought to act as an antibacterial barrier.

The scalp may also be temporarily bruised or swollen, especially in hairless newborns, and the area around the eyes may be puffy.

The newborn may also have congenital dermal melanocytosis(sometimes referred to as "Mongolian spots") (blue or blue black birthmark on the lower back), various other birthmarks, or peeling skin, particularly on the wrists, hands, ankles, and feet (as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

A newborn's genitals are enlarged and reddened, with male infants having an unusually large scrotum. The breasts may also be enlarged, even in male infants. This is caused by naturally-occurring maternal hormones and is a temporary condition.

The umbilical cord of a newborn is bluish-white in colour. After birth, the umbilical cord is normally cut, leaving a 1–2 inch stub. The umbilical stub will dry out, shrivel, darken, and spontaneously fall off within about 3 weeks. Occasionally, hospitals may apply triple dye to the umbilical stub to prevent infection, which may temporarily colour the stub and surrounding skin purple.



Figure 3.15: Lanugo on the shoulder and back of twin girls. (Image is in the public domain)

Figure 3.16: The clamping and cutting of a newborn's umbilical cord. (Image by NNethala is licensed under CC BY-SA 3.0)

## Sleep

In a typical day 24 hour period a newborn will eat and have periods of wakefulness and sleep. For many reasons this varies greatly between infants. It can take some time for an infant to fall into a somewhat recognizable and predictable schedule. A number of factors can influence this. The child's temperament, their capacity to manage stressors, whether they are bottle fed or nursed, the environment, the experience of their families.

A newborn typically sleeps approximately 16.5 hours per 24-hour period. The infant sleeps in several periods throughout the day and night, which means they wake often throughout the day and night (Salkind, 2005, as cited in Lally & Valentine-French, 2019).

Figure 3.17: An older newborn baby. (Image by brytny.com on Unsplash)

## Reflexes

Newborns are equipped with a number of **reflexes**, which are involuntary movements in response to stimulation. Some of the more common reflexes, such as the sucking reflex and rooting reflex, are important to feeding. The grasping and stepping reflexes are eventually replaced by more voluntary behaviours. Within the first few months of life these reflexes disappear, while other reflexes, such as the eye-blink, swallowing, sneezing, gagging, and withdrawal reflex stay with us as they continue to serve important functions (Lally & Valentine-French, 2019, p. 73).

## Sensory Capacities

Throughout much of history, the newborn was considered a passive, disorganized being who possessed minimal abilities. However, current research techniques have demonstrated just how developed the newborn is with especially organized sensory and perceptual abilities.

## Vision

The womb is a dark environment void of visual stimulation. Consequently, vision is the most poorly developed sense at birth and time is needed to build those neural pathways between the eye and the brain. Newborns typically cannot see further than 8 to 16 inches away from their faces, and their visual acuity is about 20/400, which

means that an infant can see something at 20 feet that an adult with normal vision could see at 400 feet. Thus, the world probably looks blurry to young infants.



Figure 3.18: A newborn gazing up at a parent. (Image is in the public domain)

*Hearing*

The infant's sense of hearing is very keen at birth, and the ability to hear is evidenced as soon as the 7th month of prenatal development. In fact, an infant can distinguish between very similar sounds as early as one month after birth and can distinguish between a familiar and unfamiliar voice even earlier. Infants are especially sensitive to the frequencies of sounds in human speech and prefer the exaggeration of infant-directed speech, which will be discussed later. Newborns also prefer their mother's voices over another female when speaking the same material (DeCasper & Fifer, 1980, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Additionally, they will register in utero specific information heard from their mother's voice (Lally & Valentine-French, 2019).

**Early Hearing**

DeCasper and Spence (1986), as cited by Paris, Ricardo, Raymond, & Johnson, 2021).  tested 16 infants whose mothers had previously read to them prenatally. The mothers read several passages to their fetuses, including the first 28 paragraphs of The Cat in the Hat, beginning when they were 7 months pregnant. The fetuses had been exposed to the stories on average of 67 times or 3.5 hours.

During the testing, the infants were able to choose between recordings of two stories, one of which was a story their mothers read to them while in the womb, based on how fast they sucked on their pacifiers. They showed a preference for the stories that their mothers read to them while in the womb (Lally & Valentine-French, 2019).

## *Touch and Pain*

Immediately after birth, a newborn is sensitive to touch and temperature, and is also highly sensitive to pain, responding with crying and cardiovascular responses (Balaban & Reisenauer, 2013, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Newborns who are circumcised, which is the surgical removal of the foreskin of the penis, without anesthesia experience pain as demonstrated by increased blood pressure, increased heart rate, decreased oxygen in the blood, and a surge of stress hormones (United States National Library of Medicine, 2016, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Research has demonstrated that infants who were circumcised without anesthesia experienced more pain and fear during routine childhood vaccines. Fortunately, many circumcisions are now done with the use of local anesthetics.

## *Taste and Smell*

Studies of taste and smell demonstrate that babies respond with different facial expressions, suggesting that certain preferences are innate. Newborns can distinguish between sour, bitter, sweet, and salty flavors and show a preference for sweet flavors. Newborns also prefer the smell of their mothers. An infant, only 6 days old is significantly more likely to turn toward its own mother's breast pad than to the breast pad of another baby's mother (Porter, Makin, Davis, & Christensen, 1992, as cited by Paris, Ricardo, Raymond, & Johnson, 2021), and within hours of birth, an infant also shows a preference for the face of its own mother (Bushnell, 2001; Bushnell, Sai, & Mullin, 1989, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

Infants seem to be born with the ability to perceive the world in an intermodal way; that is, through stimulation from more than one sensory modality. For example, infants who sucked on a pacifier with a smooth surface preferred looking at visual models of a pacifier with a smooth surface. But those that were given a pacifier with a textured surface preferred to look at a visual model of a pacifier with a textured surface (Lally & Valentine-French, 2019, p. 76-77).

Figure 3.19: A baby sucking on a pacifier. (Image by Beeki is licensed under CC0 1.0)

## A New Family

There is no doubt that becoming a parent is a life changing event and can be challenging even for those individuals who are knowledgeable about child development and have experience with children! Hormones play a critical role in pregnancy, childbirth, postpartum and lactation. The hormonal changes, the physical, emotional and psychological recovery from childbirth and delivery are experienced by the mother. In addition, the mother and baby may be figuring out nursing. According to Statistics Canada (2019), one in three women report feelings consistent with postpartum depression or an anxiety disorder. Postpartum psychosis is rarer and is experienced in about 1 in 1000 women.

In the first few days and weeks after birth the family are tasked with getting to know this brand-new human being who is unique and unlike anyone else who has ever existed...even unlike a twin sibling, if they have one! In turn the infant is learning how to live in this world...to breathe air, regulate their body temperature, communicate their needs and process information to name a few.

For a variety of reasons in Canada 30% of women giving birth are considered a lone parent. Being a lone parent can be challenging no matter the age or experience of the parent. Caring for an infant is a twenty-four hour, seven day a week job. Hopefully, the mother can access support from family members and community agencies.

The mother's partner can play a significant role in parenting, especially during this period of adjustment. The support may involve sharing in home and child care responsibilities and accepting help from friends and family. (Canadian Mental Health Association, 2021) It is important to ensure that the mother's basic needs are met. In the early days, some mothers may not even know what support they need while others will articulate their needs. They may want to shower, take a nap or eat a meal without holding the baby. When safe to do so, some mothers may wish to exercise by going for a run, to a gym class or yoga. This supports their overall well being. The partner can offer emotional support and respect the wishes of the mother. It is important to nurture the partnership during this adjustment period. Couples need protected time to share their feelings as they take on the new role of being a parent. Some couples protect time for 'date nights' to reconnect as a couple.

**The Fourth Trimester**

You may bump into this concept. The term was first used by Dr. Harvey Carp in 2002 to describe the first 12 weeks after an infant's birth. During this post-partum period the mother is adjusting to the baby and the baby is adjusting to the world. In his studies of self-regulation Dr. Stuart Shanker (2016) explains that when humans began to walk upright their hands became free to engage in more complex tasks including the use of tools which in turn led to an increase in the size of the human brain. In fact, the brain became so large that it would be impossible for a human female to give birth to an infant with a fully developed brain. So, nature adapted resulting in human infants being born with brains which continue to develop particularly in the few months after birth. This is where the fourth trimester comes in. This approach encourages new parents and caregivers to respond to the infant as if they were still in utero, recognizing that some infants are more sensitive than others as far as the demands of life outside of the womb. This might mean keeping lights dimmed, reducing noise, playing soothing music etc.

All of these factors mean that new families benefit from intentional and responsive support as they navigate their new roles and responsibilities. In the past much of this support was provided through extended families, where it was not uncommon for members of different generations to live in one household. While this still occurs in some communities and cultures, in many jurisdictions this post-partum care is now offered through health care providers and community agencies. Local health units may offer resources and services. In Ontario the EarlyON Child and Family centres offer support nursing and infant care.

New parents in all populations frequently report being sleep deprived and feeling like their lives have been turned upside down. As educators it is important to show empathy and understanding to families. Recognizing the signs that a family may be struggling is an opportunity to share community resources and agencies that can offer support.

Over the last few decades labour force participation by mothers of young children has increased significantly. Statistics show that between 1976 and 2014, the share of dual-earner couples almost doubled among couple families with children, from 36% to 69%. Families with two full-time working parents now represent at least one-half of all couple families with children in Canada (Statistics Can, 2018b). This means that many mothers need to secure care for their child so that they can work or study.

In Canada, there are a number of forms of childcare. Some families may seek regulated or formal care in a licensed early learning program. In Ontario, such programs are required to comply with provincially legislated standards in the Child Care and Early Years Act (2014). In Ontario there is a critical shortage of licensed child care spaces, particularly for infants. This means that families may end up on a long waiting list even if they put their name on the list as soon as they knew they were expecting.

Another option for regulated or formal care offered in Ontario is licensed home child care. In this model a small

number of children are cared for in the home of a child care provider who is affiliated with a licensed child care agency. Again, infant spaces are limited and families may end up on a waiting list for care. A large number of children in Ontario tend to be in what is referred to as informal or unregulated care. This could be a family's choice or be because formal care was unavailable. Other families may secure care with a friend or a relative.

## Summary

In this chapter we looked at:

- Methods of childbirth preparation

- The process of childbirth (for both vaginal and Cesarean deliveries)

- Assessing newborn health

- Problems for the newborn

- Characteristics of newborns (including appearance, reflexes, and perceptual abilities)

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**CHAPTER 4**

## *Physical Development in Infancy and Toddlerhood*

After this chapter, you should be able to:

- Describe the physical changes that occur during the first two years of life.
- Identify common infant reflexes.
- Discuss the sleep needs during the first two years of life.
- Summarize the sequence of both fine and gross motor skills.
- Recognize the developing sensory capacities of infants and toddlers.
- Explain how to meet the evolving nutritional needs of infants and toddlers.

### INTRODUCTION

Welcome to the story of physical development from infancy through toddlerhood; in Ontario the Continuum of Development considers infants ranging in age from birth to 24 months, and toddlers from 14 months to 3 years of age (Ontario Ministry of Education, 2014). When referring to infants and toddlers together in this text, we will focus on children less than 30 months old. Researchers have given this part of the life span more attention than any other period, perhaps because changes during this time are so dramatic and so noticeable and perhaps because we have assumed that what happens during these years provides a foundation for one's life to come.

### RAPID PHYSICAL CHANGES

As mentioned in the previous chapter, the average birth weight for babies is around 3.5 kg (7.5 lb), although between 2.5 kg (5.5 lb) and 4.5 kg (10 lb) is considered normal. Newborns often lose around 230 g (8 oz) in the first 4 to 5 days after birth but regain it by about 10 to 12 days of age. In the first month, the typical newborn gains about 20 g (0.7 oz) a day, or about 110 g (4 oz) to 230 g (8 oz) a week.

The average length of full-term babies at birth is 51 cm. (20 in), although the normal range is 46 cm (18 in.) to 56 cm (22 in.). In the first month, babies typically grow 4 cm (1.5 in.) to 5 cm (2 in.). (Government of Alberta, 2021).

Two hormones are very important to this growth process. The first is Human Growth Hormone (HGH) which influences all growth except that in the Central Nervous System (CNS). The hormone influencing growth in the CNS is called Thyroid Stimulating Hormone. Together these hormones influence growth in early childhood

## PROPORTIONS OF THE BODY

The increased weight that takes place in the first several years of life results in a change in body proportions. The head initially makes up about 50 percent of our entire length when we are developing in the womb. At birth, the head makes up about 25 percent of our length (think about how much of your length would be head if the proportions were still the same!). By age 25 it comprises about 20 percent our length. Imagine now how difficult it must be to raise one's head during the first year of life! And indeed, if you have ever seen a 2 to 4 month old infant lying on the stomach trying to raise the head, you know how much of a challenge this is. The comparison in this graphic was originally introduced in the last chapter.
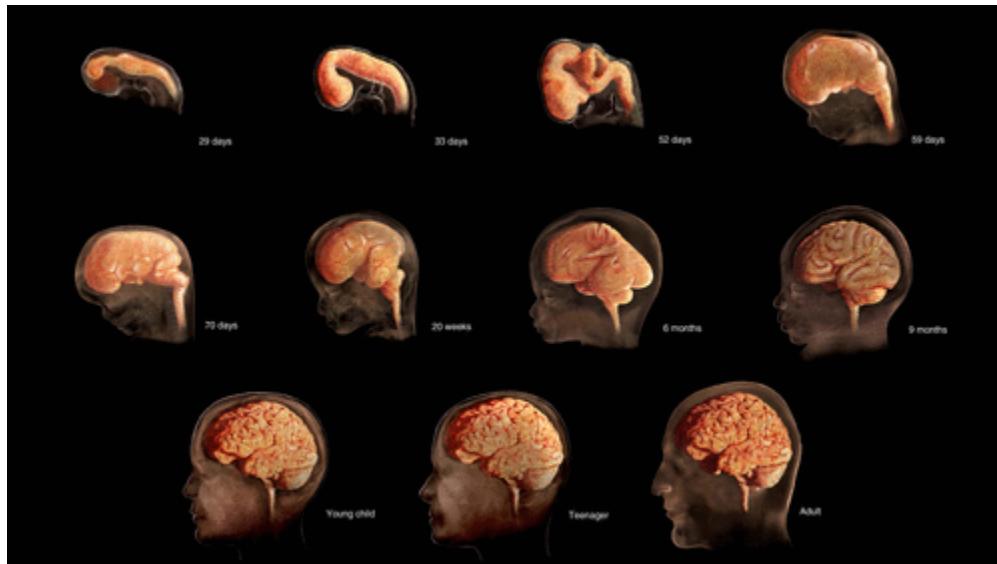


Figure 4.1: (Image: © TheVisualMD/Science Source. )

Some of the most dramatic physical changes that occur during this period happen in the brain. At birth, the brain is already about 25 percent its adult weight and this is not true for any other part of the body. By age 2, it is at 75 percent its adult weight, at 95 percent by age 6 and at 100 percent by age 7 years.

The basic building blocks of the brain are specialized nerve cells called neurons. These neurons proliferate before birth. In fact, a fetus' brain produces roughly twice as many neurons as it will eventually need — a safety margin that gives newborns the best possible chance of coming into the world with healthy brains. Most of the excess neurons are shed in utero, leaving approximately 100 billion of these brain nerve cells left present at birth. As a child matures, the number of neurons they have will remain relatively stable, but each brain nerve cell will grow, becoming bigger and heavier. This happens with both regular growth, and as the dendrites connect the neurons together (Graham & Forstadt, 2011).

## Components of the Neuron
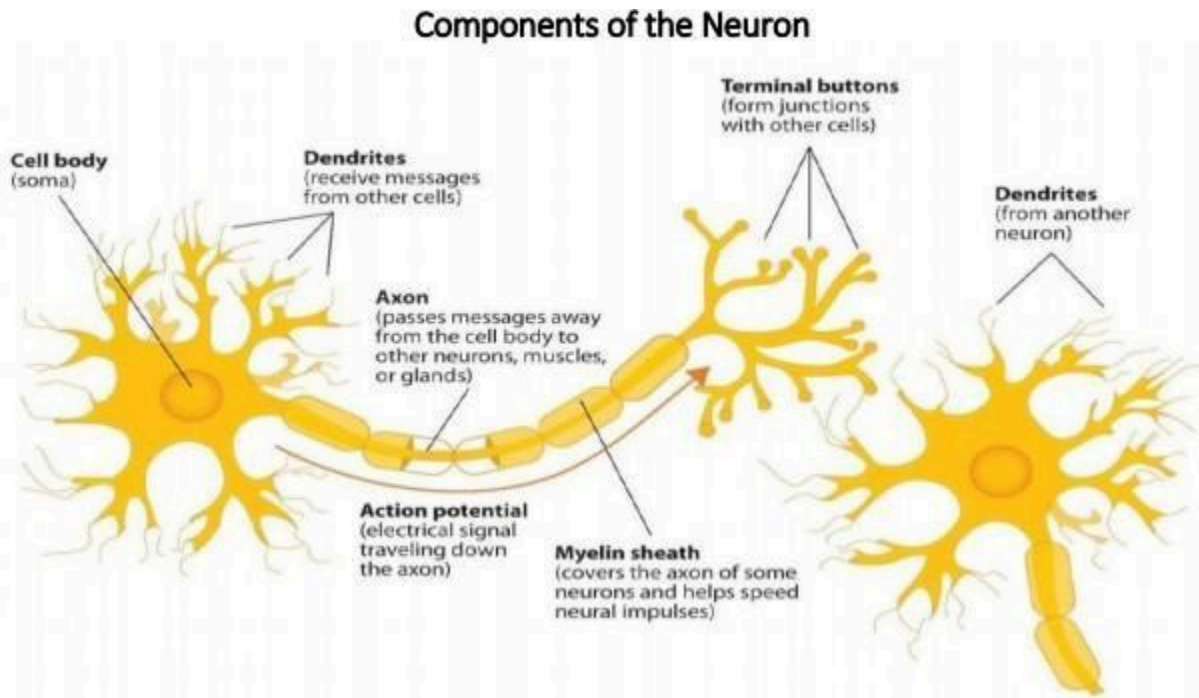
Figure 4.2: Components of the Neuron

There is a proliferation of these dendrites during the first two years so that by age 2, a single neuron might have thousands of dendrites. After this dramatic increase, the neural pathways that are not used will be eliminated thereby making those that are used much stronger (Lumen Learning, n.d.). Because of this proliferation of dendrites, by age two a single neuron might have thousands of dendrites.

Synaptogenesis, or the formation of connections between neurons, continues from the prenatal period forming thousands of new connections during infancy and toddlerhood. This period of rapid neural growth is referred to as Synaptic Blooming (Lumen Learning, n.d.). This activity is occurring primarily in the cortex or the thin outer covering of the brain involved in voluntary activity and thinking. The prefrontal cortex that is located behind our forehead continues to grow and mature throughout childhood and experiences an additional growth spurt during adolescence. It is the last part of the brain to mature and will eventually comprise 85 percent of the brain's weight. Experience will shape which of these connections are maintained and which of these are lost. Ultimately, about 40 percent of these connections will be lost (Webb, Monk, and Nelson, 2001, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). As the prefrontal cortex matures, the child is increasingly able to regulate or control emotions, to plan activity, strategize, and have better judgment. Of course, this is not fully accomplished in infancy and toddlerhood but continues throughout childhood and adolescence.

Another major change occurring in the central nervous system is the development of myelin, a coating of fatty tissues around the axon of the neuron. Myelin helps insulate the nerve cell and speed the rate of transmission of impulses from one cell to another. This enhances the building of neural pathways and improves coordination and control of movement and thought processes. The development of myelin continues into adolescence but is most dramatic during the first several years of life (Lally & Valentine-French, 2019).

## REFLEXES

Infants are equipped with a number of reflexes which are involuntary movements in response to stimulation. These include the sucking reflex (infants suck on objects that touch their lips automatically), the rooting reflex (which involves turning toward any object that touches the cheek), the palmar grasp (the infant will tightly grasp any object placed in its palm), and the dancing reflex (evident when the infant is held in a standing position and

moves its feet up and down alternately as if dancing). These movements occur automatically and are signals that the infant is functioning well neurologically. Within the first several weeks of life these reflexes are replaced with voluntary movements or motor skills.
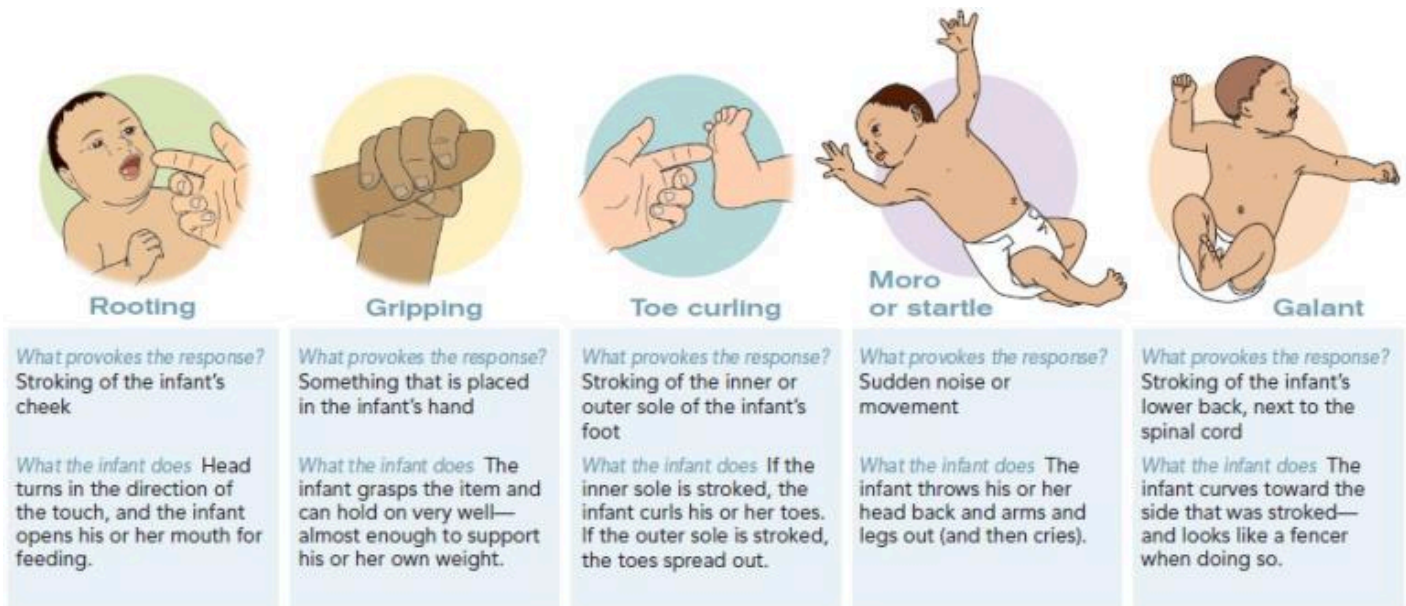


**FIGURE 9.2** **Some Infant Reflexes** Infants are born with a number of reflexes to get them through life, and they are incredibly cute when they perform them. These reflexes disappear as infants mature.

Figure 4.3: (Image: https://www.sutori.com/en/item/untitled-4f52-ab3f)

As discussed earlier, the Continuum of Development is a guide, produced by the Ontario Ministry of Education, that identifies sequences of development across five domains. A domain is a broad area or dimension of development. One of the five domains outlined in the Continuum of Development is Physical. Physical skills learned by an infant are: Gross Motor Skills, Fine Motor Skills, Senses and Sensory Motor Integration (Ontario Ministry of Education, 2014).

## GROSS MOTOR SKILLS

Gross motor skills are voluntary movements which involve the use and coordination of large muscle groups and are typically large movements of the arms, legs, head, and torso. They are also referred to as large motor skills. These skills begin to develop first. Examples include moving to bring the chin up when lying on the stomach, moving the chest up, rocking back and forth on hands and knees, and then locomotion. It also includes exploring an object with ones feet as many babies do as early as 8 weeks of age if seated in a carrier or other device that frees the hips. This may be easier than reaching for an object with the hands, which requires much more practice (Berk, 2007, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Sometimes an infant will try to move toward an object while crawling and surprisingly move backward because of the greater amount of strength in the arms than in the legs! This also tends to lead infants to pull up on furniture, usually with the goal of reaching a desired object. Usually, this will also lead to taking steps and eventually walking (Leon, n.d.).

When considering gross motor movements, the Continuum of Development focuses on the following:

- **Reaching and holding:** reaching towards objects as well as reaching and holding with palmar grasp;
- **Releasing objects:** dropping and throwing objects;
- **Holding Head up:** lifting one's head while held on a shoulder;

- **Lifting upper body:** lifting one's upper body while lying on the floor;
- **Rolling:** rolling from side to back and rolling from back to side;
- **Sitting:** sitting without support;
- **Crawling:** crawling on hands and/or knees;
- **Pulling self to stand:** using objects/people to pull self to standing position;
- **Cruising:** walking while holding onto objects;
- **Walking:** moving on one's feet, unassisted, with a wide gait;
- **Strength:** increasing strength in gross motor skills
- **Coordination:** using different body parts at the same time, smoothly and efficiently. (Ontario Ministry of Education, 2014)

## FINE MOTOR SKILLS

More exact movements of the feet, toes, hands, and fingers are referred to as fine motor skills (or small motor skills). When considering fine motor skills, the Continuum of Development focuses on:

- **Palmar grasp:** holding objects with whole palm;
- **Coordination:** holding and transferring object from hand to hand and manipulating small objects with improved coordination;
- **Pincer grasp:** using forefinger and thumb to lift and hold small objects;
- **Holding and using tools:** making marks with first crayon, or using utensil to feed. (Ontario Ministry of Education, 2014)

## THE SENSES

The brain interprets the information that the senses collect from the environment. When considering the senses, the Continuum of Development focuses on the following:

1. **Visual:** The Continuum of Development focuses on the following four elements of visual sense development:

    - **Face Perception:** showing a preference for simple face-like patterns by looking longer, responding to emotional expressions with facial expressions and gestures, and/or turning and looking at familiar faces;
    - **Pattern Perception:** showing a preference for patterns with large elements, showing a preference for increasingly complex patterns, visually exploring borders and/or visually exploring entire object;
    - **Visual Exploration:** tracking moving objects with eyes, and/or looking and searching visually;
    - **Visual Discrimination**: scanning objects and identifying them by sight. (Ontario Ministry of Education, 2014)

It is important to share that the womb is a dark environment void of visual stimulation. Consequently, vision is the most poorly developed sense at birth and time is needed to build those neural pathways between the

eye and the brain. Newborns typically cannot see further than 8 to 16 inches away from their faces (which is about the distance from the newborn's face to the mother/caregiver when an infant is breastfeeding/bottle-feeding). Their visual acuity is about 20/400, which means that an infant can see something at 20 feet that an adult with normal vision could see at 400 feet. Thus, the world probably looks blurry to young infants. Because of their poor visual acuity, they look longer at checkerboards with fewer large squares than with many small squares. Infants' thresholds for seeing a visual pattern are higher than that of an adults. Thus, toys for infants are sometimes manufactured with black and white patterns rather than pastel colours because the higher contrast between black and white makes the pattern more visible to the immature visual system. By about 6 months, infants' visual acuity improves and approximates adult 20/25 acuity.

When viewing a person's face, newborns do not look at the eyes the way adults do; rather, they tend to look at the chin – a less detailed part of the face. However, by 2 or 3 months, they will seek more detail when exploring an object visually and begin showing preferences for unusual images over familiar ones, for patterns over solids, for faces over patterns, and for three- dimensional objects over flat images. Newborns have difficulty distinguishing between colours, but within a few months, they are able to discriminate between colours as well as adults do. Sensitivity to binocular depth cues, which require inputs from both eyes, is evident by about 3 months and continues to develop during the first 6 months. By 6 months, the infant can perceive depth perception in pictures as well (Sen, Yonas, & Knill, 2001, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Infants who have experience crawling and exploring will pay greater attention to visual cues of depth and modify their actions accordingly (Berk, 2007, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

2. **Auditory:** The Continuum of Development focuses on the following two elements of auditory sense development.

    ◦ **Auditory Exploration:** making sounds by shaking and banging objects; turning to source of a sound, responding to familiar sounds with gestures and actions, and/or responding by turning towards a sound even when more than one sound is present;

    ◦ **Auditory Discrimination:** touching, rubbing, squeezing materials. (Ontario Ministry of Education, 2014)

The infant's sense of hearing is very keen at birth, and the ability to hear is evident as soon as the 7th month of prenatal development. In fact, an infant can distinguish between very similar sounds as early as one month after birth and can distinguish between a familiar and unfamiliar voice even earlier. Infants are especially sensitive to the frequencies of sounds in human speech and prefer the exaggeration of infant-directed speech, which will be discussed later. Additionally, infants are innately ready to respond to the sounds of any language, but some of this ability will be lost by 7 or 8 months as the infant becomes familiar with the sounds of a particular language and less sensitive to sounds that are part of an unfamiliar language.

Newborns also prefer their mother's voices over another female when speaking the same material (DeCasper & Fifer, 1980, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Additionally, they will register in utero specific information heard from their mother's voice.

3. **Touch:** As discussed above, many areas of the infant's body respond reflectively when touched. Touching an infant's cheek, mouth, hand and foot produces reflexive movements, signifying that the infant feels those touches. Immediately after birth, a newborn is sensitive to touch and temperature, and is also highly sensitive to pain, responding with crying and cardiovascular responses (Balaban & Reisenauer, 2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Newborns who are circumcised, which is the surgical removal of the foreskin of the penis, without anesthesia experience pain as

demonstrated by increased blood pressure, increased heart rate, decreased oxygen in the blood, and a surge of stress hormones (United States National Library of Medicine, 2016, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

4. **Olfactory:** Infants have a keen sense of smell. Studies have shown that they prefer the smell of their mothers. An infant only 6 days old is significantly more likely to turn toward its own mother's breast pad than to the breast pad of another baby's mother (Porter, Makin, Davis, & Christensen, 1992, as cited in Paris, Ricardo, Raymond, & Johnson, 2021), and within hours of birth, an infant also shows a preference for the face of its own mother (Bushnell, 2001; Bushnell, Sai, & Mullin, 1989, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

5. **Taste:** Infants have a highly developed sense of taste. They can distinguish between sour, bitter, sweet, and salty flavours and show a preference for sweet flavours (Rostenstein & Oster, 1997, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Infants seem to have a preference for sweet tastes and responding by smiling, sucking and licking their lips (Kaijura, Cowart and Beauchamp, 1992, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Also, it has been found that they will nurse more after their mother has consumed a sweet tasting substance, such as vanilla (Mennella & Beauchamp, 1996, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## SENSORY MOTOR INTEGRATION

According to Brown (n.d.), sensory motor integration refers to a relationship between the sensory system (nerves) and the motor system (muscles). Also, it refers to the process by which these two systems (sensory and motor) communicate and coordinate with each other. In the process of developing sensory motor integration, a child first learns to move and then they learn through movement. Learning to move involves continuous development in a child's ability to use the body with more and more skillful purposeful movement. Then, through this movement, the child learns more about themselves as they explores their environment. The process has three parts: (1) a sense organ receives a stimulus, (2) the nerves carry the information to the brain where the information is interpreted. (3) The brain then determines what response to make and transmits its instructions to the appropriate group of muscle fibres that carry out the response.

These two systems work together as a team, and if the sending nerve impulses are problematic, the brain will not receive the message, and if the breakdown is in the motor nerves, the muscles will not get a clear message and will not be able to give the correct motor response (Brown, n.d.). Interestingly, infants seem to be born with the ability to perceive the world in an intermodal way; that is, through stimulation from more than one sensory modality. For example, infants who sucked on a pacifier with either a smooth or textured surface preferred to look at a corresponding (smooth or textured) visual model of the pacifier. By 4 months, infants can match lip movements with speech sounds and can match other audiovisual events. Although sensory development emphasizes the afferent processes used to take in information from the environment, these sensory processes can be affected by the infant's developing motor abilities. Reaching, crawling, and other actions allow the infant to see, touch, and organize his or her experiences in new ways (Brown, n.d).

## NUTRITION

### Feeding Infants

According to the Canadian Pediatric Society (2020), for the first six months of life, breastfed infants will get what they need from their mother's milk. Breast milk has the right amount and quality of nutrients to suit the baby's

first food needs. Breast milk also contains antibodies and other immune factors that help infants prevent and fight off illness. There are many reasons that mothers struggle to breastfeed or should not breastfeed, including: low milk supply, previous breast surgeries, illicit drug use, medications, infectious disease, and inverted nipples. Other mothers choose not to breastfeed. Some reasons for this include: lack of personal comfort with nursing, the time commitment of nursing, inadequate or unhealthy diet, and wanting more convenience and flexibility with who and when an infant can be fed. If breastfeeding is not an option, it is recommended that families seek out a store-bought iron-fortified infant formula for the first 9 to 12 months. This formula should be cow milk-based unless the infant cannot consume dairy-based products for medical, cultural or religious reasons. It should be noted that breastfed and bottle-fed infants adjust equally well emotionally (Ferguson & Woodward, 1999, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## Introducing Infants to Solid Food

According to the Canadian Pediatric Society (2020), while breast feeding and/or bottle feeding must still occur, at about 6 months of age most babies are ready to be introduced to solid foods. Typically, infants are ready for this milestone when they:

- Can sit up without support, lean forward, and have good control of their neck muscles.
- Have the ability to pick up food and try to put it in their mouth.
- Can hold food in their mouth without pushing it out with their tongue right away.
- Show interest in food when others are eating.
- Open their mouth when they see food coming their way.
- Can let you know they don't want food by leaning back or turning their head away.

| Age | Physical milestones | Social milestones |
|---|---|---|
| Birth to 4 months | • opens mouth wide when nipples touches lips <br> • sucks and swallows | • recognizes source of milk by about 10 weeks |
| 4 to 6 months | • sucking strength increases <br> • brings finger to mouth | • socializes during feeding |
| 6 to 9 months | • drinks from a cup held by an adult <br> • eats soft food from a spoon <br> • begins rotary chewing (in a circular motion) <br> • enjoys holding food and finger-feeding | • loves to be included at the table for meals <br> • begins to show likes and dislikes for certain foods |
| 9 to 12 months | • tries to use a spoon <br> • starts to finger feed with a more advanced grasp <br> • feeds at regular times | • is aware of what others do <br> • imitates others |
| 12 to 18 months | • grasps and releases food with fingers <br> • holds spoon but use is awkward <br> • turns spoon in mouth <br> • uses a cup but may dribble | • wants food that others are eating <br> • loves performing <br> • understands simple questions and requests |
| 18 to 24 months | • appetite decreases <br> • likes eating with hands <br> • likes trying different textures | • is easily distracted <br> • prefers certain foods <br> • ritual becomes important |

Table 4.1: Developmental milestones related to feeding. (Canadian Pediatric Society, 2020)

## How Should Foods Be Introduced?

The Canadian Paediatric Society (2020) shares that there are many ways to introduce solid food to ready infants. The first foods usually vary from culture to culture and from family to family. Healthy foods that the family is already eating are usually the best choice for the infant. It is recommended that families begin by introducing foods that contain iron, which babies need for many different aspects of their development. Meat, poultry, cooked whole egg, fish, tofu, and well-cooked legumes (beans, peas, lentils) are all good sources of iron. These foods are served to an infant in pureed form. Pureed food can be purchased commercially or can be made from home. If they are purchased, it is important to read the nutritional labels to ensure that there is no added salt or sugar. Infants should be introduced to foods with variety of textures (such as lumpy, tender-cooked and finely minced, puréed, mashed or ground), as well as soft finger foods. Staggering the introduction of new foods is always recommended. Infants should be allowed to try one food at a time at first and there should be 3 to 5 days before another food is introduced. This helps caregivers identify if the child has any reactions with that food, such as food allergies.

An allergy happens when a person's immune system treats a substance (allergen) like an inappropriate invader. The body will try to protect itself by releasing a chemical into the body called histamine. This chemical is what causes the symptoms that are unpleasant or even dangerous. The reaction can start very suddenly, even after being exposed to a small amount of the allergen. An allergic reaction can affect many different body parts. Symptoms can include: itchy mouth and throat when eating certain foods, hives (raised red, itchy bumps on the

skin), stomach trouble (diarrhea, cramps, nausea, vomiting), swelling of the face or tongue, or trouble breathing. Any food can trigger an allergic reaction, but the most common are: peanuts, tree nuts, eggs, shellfish, fish, milk, soy, wheat (Canadian Paediatric Society, 2021). Sometimes, allergic reactions can be very serious, even life-threatening. In rare cases, a child may have a rapid and severe reaction to an allergen. This is called anaphylactic shock or anaphylaxis. It can happen within minutes or up to 2 hours after being exposed to an allergen. Symptoms of anaphylaxis include: difficulty breathing, swelling of the face, throat, lips, and tongue (in cases of food allergies), rapid drop in blood pressure, dizziness, unconsciousness, hives, tightness of the throat, hoarse voice, lightheadedness.

It isn't recommended that families wait longer to introduce common allergenic foods to their infants as there is no evidence that avoiding certain foods will prevent allergies in children. If a reaction is identified, families will typically reach out to their paediatrician for support and recommendations. Children can outgrow some types of food allergies, especially if the allergy started before age 3. Allergies to milk, for example, will usually go away. However, some allergies, like those to nuts and fish, may not go away.

Some children have reactions to foods that are not as severe as discussed above. A food intolerance is different from an allergy. It is not caused by an immune reaction. Food intolerance will cause discomfort, but it's not dangerous. Symptoms that may be experienced include bloating, loose stools, gas or other symptoms after eating a specific food. Even though this reaction is not dangerous, families often make the choice to avoid those foods in the future and this must be respected in the early learning environment.

| Iron-rich foods | Pureed, minced, diced or cooked meat, fish, chicken, tofu, mashed beans, peas or lentils, eggs, iron-fortified infant cereal. |
|---|---|
| **After 6 months** | |
| Grain products | Iron-fortified infant cereal, small pieces of dry toasts, small plain cereals, whole grain bread pieces, rice and small-sized pasta. |
| Vegetables | Pureed, mashed, lumpy or pieces of soft cooked vegetables. |
| Fruit | Pureed, mashed or lumpy soft fruit. Pieces of very ripe soft fresh fruit, peeled, seeded and diced or canned fruit (not packed with syrup). |
| Milk products | Dairy foods like full-fat-yogurt, full-fat grated or cubed pasteurized cheeses, cottage cheese. |
| **9 to 12 months** | |
| Milk | Whole cow's milk (3.25%) can be introduced if breastmilk is no longer available, between 9-12 months.<br>After 12 months of age, your baby should not take more than 25 ounces (750 mL) of milk per day. Otherwise, they will fill up and won't want to eat solid foods. Too much milk can also lead to iron deficiency anemia. |

Table 4.2: First foods – Around 6 months (Canadian Paediatric Society, 2020)

| Meal Times | 6 to 9 months |
|---|---|
| Early morning | Breastmilk or infant formula<br>Vitamin D drops for breastfed babies |
| Breakfast | Breastmilk or infant formula, iron fortified infant cereal mixed with breastmilk, formula or water<br>Mashed fruit like banana or pears mixed with full fat plain yogurt |
| Snack | Breastmilk or infant formula |
| Lunch | Breastmilk or infant formula, iron fortified infant cereal mixed with breastmilk, formula or water<br>Mashed vegetables (sweet potato, squash or carrots)<br>Cooked ground beef, chicken, pork or fish<br>Well-cooked chopped egg or silken (soft) tofu |
| Snack | Breastmilk or infant formula |
| Dinner | Breastmilk or infant formula, iron fortified infant cereal mixed with breastmilk, formula or water<br>Cooked vegetables (carrots, pieces of soft-cooked green beans or broccoli)<br>Cooked, minced chicken or turkey or canned or cooked legumes (beans, lentils, or peas)<br>Fruits like unsweetened applesauce, mashed banana or pureed melon mixed with full fat plain yogurt |
| Bedtime snack | Breastmilk or infant formula |

Table 4.3: Sample Meals for Baby: 6 to 9 months old (Dieticians of Canada, 2020)

| Meal times | 9 to 12 months |
|---|---|
| **Early morning** | Breastmilk, infant formula or 3.25% homogenized whole cow's milk<br>Vitamin D drops |
| **Breakfast** | Iron fortified infant cereal mixed with breastmilk, formula, 3.25% homogenized whole cow's milk or water<br>Full-fat plain yogurt, unsalted cottage cheese or grated cheese<br>Cooked chopped egg<br>Soft fruit (chopped banana, avocado, peach, seedless watermelon, cantaloupe, papaya, plum or kiwi)<br>Breastmilk, formula or 3.25% homogenized whole cow's milk |
| **Morning Snack** | Strips of whole-grain bread or roti<br>Grated apple or chopped strawberries<br>Breastmilk, formula or 3.25% homogenized whole cow's milk |
| **Lunch** | Infant cereal mixed with breastmilk, formula, 3.25% homogenized whole cow's milk or water<br>Minced or chopped soft-cooked meat (lamb, pork, veal or beef)<br>Cooked whole wheat pasta, rice or pita bread<br>Cubed avocado or peeled and chopped cucumber<br>Breastmilk, formula or 3.25% homogenized whole cow's milk |
| **Afternoon Snack** | Cheese cubes (full fat mozzarella, Swiss or cheddar) with pieces of unsalted whole grain crackers or toast<br>Breastmilk, formula or 3.25% homogenized whole cow's milk |
| **Dinner** | Infant cereal mixed with breastmilk, formula, 3.25% homogenized whole cow's milk or water<br>Diced or cut up cooked or canned flaked fish or pieces of firm tofu or chicken<br>Cut up vegetables (soft-cooked green beans, okra, cauliflower, broccoli or carrots)<br>Soft fruit (chopped banana, ripe peach or mango or quartered grapes)<br>Breastmilk, formula or 3.25% homogenized whole cow's milk |
| **Bedtime Snack** | Small pieces of whole grain toast, bread, crackers or unsweetened dry O-shaped cereal<br>Breastmilk, formula or 3.25% homogenized whole cow's milk |

Table 4.4: Sample Meals for Baby: 9 to 12 months old (Dieticians of Canada, 2020)

Infants attending licensed child care in Ontario will have an individualized feeding plan designed with their primary educator. Feeding can include breast/formula bottles and/or solid foods and can be done on schedule (every 3-4 hours) and on demand (as the infant shows hunger cues). Typically, one educator is assigned to the feeding of each infant. The educator is not only responsible for the actual feeding of the child, as per the plan, but also for documenting what was eaten. This documentation is communicated with the family, either through a communication book or a software application like Seesaw, HiMama or Storypark, etc.

According to Leduc (2015), understanding hunger cues in infants is very important – rapid eye movement, waking, stretching, hand-to mouth activity, sucking, licking... These are all the ways that infants can communicate what they need to you.

## Early cues "I'm hungry."

| Stirring | Mouth opening | Turning head, seeking/rooting |

## Mid cues "I'm really hungry."

| Stretching | Increasing physical movement | Hand to mouth |

## Late cues "Calm me then feed me."

| Crying | Agitated movement | Colour turning red |

### Time to calm crying baby
- cuddling
- skin-to-skin on chest
- talking
- stroking

For more information refer to the Queensland Health booklet *Child Health Information: Your guide to the first twelve months*
Visit the Queensland Health breastfeeding website: http://www.health.qld.gov.au/breastfeeding/

**Queensland Government**

Figure 4.4: (Queensland Government, 2010)

When feeding infants, it is important to make feeding time calm. This time is a good opportunity for the building of rapport – talk, sing, be in the moment; let the child regulate the milk intake – do not coax/force child to drink; keep the nipple of the bottle full of milk/formula to reduce the amount of swallowing too much air (Leduc, 2015).

According to the Dieticians of Canada (2020), it is recommended that children one years old and up follow the Canada Food Guide. Children need a balanced diet with food from all 3 food groups—vegetables and fruit, whole grain products, and protein foods. Children need 3 meals a day and 2 to 3 snacks (morning, afternoon and possibly before bed). Healthy snacks are just as important as the food served at meals.

| Sample Menu 1 | |
| --- | --- |
| **Breakfast** | Mini Oatmeal pancakes with sliced bananas and nut butter<br>Breastmilk or milk in a cup |
| **Morning Snack** | Ripe melon pieces<br>Plain, vanilla or fruit yogurt<br>  Water |
| **Lunch** | Meatballs (cut into small pieces)<br>Plain macaroni or penne pasta<br>  Cooked sweet potato<br>  Breastmilk or milk in a cup |
| **Afternoon Snack** | 100% whole wheat unsalted crackers<br>Cheese cubes<br>  Water |
| **Dinner** | Baked risotto with salmon<br>Carrots and parsnips<br>  Breastmilk or water |
| **Bedtime Snack** | Fruity Tutti Muffins with applesauce<br>Breastmilk or milk in a cup |

Table 4.5: Sample Meals for Feeding Toddlers (1 to 3 years old) (Dieticians of Canada, 2020)

Remember as the educator, it is your job to:

- Set regular meal and snack times. Share mealtimes and eat with the children.
- Offer a balance and variety of foods from all three food groups at mealtimes.
- Offer food in ways they can manage easily. For example: cut into pieces, or mash food to prevent choking in younger children.
- Help children learn to use a spoon or cup so they can eat independently.
- Include the child in age-appropriate food preparation and table setting.
- Avoid using dessert as a bribe. Serve healthy dessert choices, such as a fruit cup or yogurt.
- Show children how you read labels to help you choose foods on the menu, as applicable.
- Act as a role model by making healthy food choices while working with the children.

But it is the child's job to:

- Choose what to eat from the foods you provide at meal and snack time (and sometimes that may mean not eating at all).
- Eat as much or as little as he/she wants. (Leduc, 2015)

## Child Malnutrition

There can be serious effects in the physical growth and development of children when there are deficiencies in their nutrition.

Failure to thrive is a term used to describe a child who seems to be gaining weight or height more slowly than other children of the same age and gender (SickKids, 2009). There are many reasons why a baby might be small for their age; they do not always mean failure to thrive. According to the National Institute of Health (as cited by SickKids, 2009), to be identified as an infant with failure to thrive, the child's weight must be less than the third percentile on a standard growth chart, or 20% below the ideal weight for length or a fall-off from a previously established growth curve. There are a variety of causes for failure to thrive including maternal stress, diluted formula, feeding difficulties or specific health conditions. Infants who have untreated failure to thrive are at risk of slow development of physical skills, such as rolling over, standing, and walking (SickKids, 2009).

## HEALTH

Infants depend on the adults that care for them to promote and protect their health. The following section addresses common physical conditions that can affect infants, the danger of shaking babies, and the importance of immunizations.

## Common Physical Conditions and Issues during Infancy

Some physical conditions and issues are very common during infancy. Many are normal, and the infant's caregivers can deal with them if they occur. Mostly, it is a matter of the caregivers learning about what is normal for their infant and getting comfortable with the new routine in the household. New parents and caregivers often have questions about the following:

### Bowel Movements

Infants' bowel movements go through many changes in colour and consistency, even within the first few days after birth. While the colour, consistency, and frequency of stool will vary, hard or dry stools may indicate dehydration and increased frequency of watery stools may indicate diarrhea.

### Colic

Many infants are fussy in the evenings, but if the crying does not stop and gets worse throughout the day or night, it may be caused by colic. According to SickKids (2009), colic is a term used when a baby cries frequently and intensely and is difficult or impossible to soothe. There is disagreement among experts about a formal definition for colic, or if the term colic should even be used. Colic is sometimes diagnosed by the "rule of three": crying about three hours per day, at least three times per week, for at least three weeks straight. The excessive crying typically begins in the second week of life and continues toward the end of the second month. After that, the colicky behaviour tapers off, usually ending by three or four months of age. Some babies with colic may appear as if they are in pain. They may tend to stretch out their arms and legs, stiffen, and then draw in their arms and legs tightly to their bodies. Their stomachs may be swollen and tight. They may cry inconsolably or scream, extend or pull up their legs, and pass gas. Their stomachs may be enlarged. The crying spells can occur anytime, although they often get worse in the early evening.

It's normal for healthy babies to cry and some babies cry much more than others. And they cannot always be

consoled and caregivers can feel pushed to the limit. When caregivers lose control and shake a baby it can have devastating effects.

**Shaken Baby Syndrome (SBS)** is a severe form of physical child abuse. SBS may be caused from vigorously shaking an infant by the shoulders, arms, or legs. The "whiplash" effect can cause intracranial (within the brain) or intraocular (within the eyes) bleeding. Often there is no obvious external head trauma. Still, children with SBS may display some outward signs:

- Change in sleeping pattern or inability to be awakened
- Confused, restless, or agitated state
- Convulsions or seizures Loss of energy or motivation
- Slurred speech
- Uncontrollable crying
- Inability to be consoled
- Inability to nurse or eat

SBS can result in death, paralysis, developmental delays, severe motor dysfunction, spasticity, blindness, and/or seizures.

**Who's at Risk?**

Small children are especially vulnerable to this type of abuse. Their heads are large in comparison to their bodies, and their neck muscles are weak. Children under one year of age are at highest risk, but SBS has been reported in children up to five years of age.

**Can It Be Prevented?**

SBS is completely preventable. However, it is not known whether educational efforts will effectively prevent this type of abuse. Home visitation programs are shown to prevent child abuse in general. Home visits bring community resources to families in their homes. Health professionals provide information, healthcare, psychological support, and other services that can help people to be more effective parents and care-givers.

**The Bottom Line**

Shaking a baby can cause death or permanent brain damage. It can result in life-long disability. Healthy strategies for dealing with a crying baby include:

- Finding the reason for the crying
- Checking for signs of illness or discomfort, such as diaper rash, teething, tight clothing; feeding or burping;
- Soothing the baby by rubbing its back; gently rocking; offering a pacifier; singing or talking;
- Taking a walk using a stroller or a drive in a properly-secured car seat; or calling the doctor if sickness is suspected

All babies cry. Caregivers often feel overwhelmed by a crying baby. Calling a friend, relative, or neighbour for support or assistance lets the caregiver take a break from the situation. If immediate support is not available, the caregiver could place the baby in a crib (making sure the baby is safe), close the door, and check on the baby every five minutes (Safe to Sleep, n.d., as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

### Diaper Rash

A rash on the skin covered by a diaper is quite common. It is usually caused by irritation of the skin from being in contact with stool and urine. It can get worse during bouts of diarrhea. Diaper rash usually can be prevented by frequent diaper changes.

### Spitting Up/Vomiting

Spitting up is a common occurrence for young infants and is usually not a sign of a more serious problem. But if an infant is not gaining weight or shows other signs of illness, a health care provider should be consulted.

### Teething

Babies are born with a set of 20 teeth hidden beneath the gums. Teething is the process of these teeth working their way through the gums. The first teeth normally appear between six and ten months of age, with the rest following over the next two to three years (Ontario Early Years, 2002). As teeth break through the gums, some infants become fussy, and irritable; lose their appetite; or drool more than usual. Teething can cause minor discomfort. Infants may:

- drool
- be more cranky and irritable;
- have red cheeks and red, swollen gums
- show a need to chew on things

While over-the-counter gels for teething should not be used unless advised by a doctor, you can help a infant/child cope safely with teething by:

- Directly massaging an irritated, swollen gum with your finger for a couple of minutes.
- Massaging the gum with a clean, wet cloth that has been chilled in the refrigerator also works well.
- Providing infants/toddlers with a teething ring, wet cloth that has been chilled or chilled foods like banana (hard foods like carrots could cause choking). Babies massage their own gums by chewing on hard, smooth objects like these.

If these suggestions don't seem to help, an infant's dose of acetaminophen (over-the counter pain reliever) can be given for one day (Ontario Early Years, 2002).

### Urination

Infants urinate as often as every 1 to 3 hours or as infrequently as every 4 to 6 hours. In case of sickness or if the weather is very hot, urine output might drop by half and still be normal. If an infant shows any signs of distress while urinating or if any blood is found in a wet diaper medical care should be sought.

### Jaundice

Jaundice can cause an infant's skin, eyes, and mouth to turn a yellowish colour. The yellow colour is caused by a buildup of bilirubin, a substance that is produced in the body during the normal process of breaking down old red

blood cells and forming new ones. Normally the liver removes bilirubin from the body. But, for many infants, in the first few days after birth, the liver is not yet working at its full power. As a result, the level of bilirubin in the blood gets too high, causing the infant's colour to become slightly yellow—this is jaundice. Although jaundice is common and usually not serious, in some cases, high levels of bilirubin could cause brain injury. All infants with jaundice need to be seen by a health care provider. Many infants need no treatment. Their livers start to catch up quickly and begin to remove bilirubin normally, usually within a few days after birth. For some infants, health care providers prescribe phototherapy—a treatment using a special lamp—to help break down the bilirubin in their bodies.



Figure 4.5:  An infant receiving treatment for jaundice. (Image by Andres and Antoinette Ricardo used with permission)

## PROTECTING HEALTH THROUGH IMMUNIZATION

One way we can protect a child's health (and those around them) is through immunization. The vaccines (given through injection) may hurt a little…but the diseases they can prevent can hurt a lot more! Immunization shots, or vaccinations, are essential. They protect against things like measles, mumps, rubella, hepatitis B, polio, diphtheria, tetanus and pertussis (whooping cough). Immunizations are important for adults as well as for children. Here's why.

The immune system helps the human body fight germs and bacteria by producing substances to combat them. Once it does, the immune system "remembers" the germ and can fight it again. Vaccines contain germs and bacteria that have been killed or weakened. When given to a healthy person, the vaccine triggers the immune system to respond and thus build immunity.

Before vaccines, people became immune only by actually getting a disease and surviving it. Immunizations are an easier and less risky way to become immune.

Vaccines are the best defense we have against serious, preventable, and sometimes deadly contagious diseases. Vaccines are some of the safest medical products available, but like any other medical product, there may be risks. Accurate information about the value of vaccines as well as their possible side effects helps people to make informed decisions about vaccination.

Figure 4.6: A nurse giving an infant vaccinations. (Image by Maria Immaculata Hospital is licensed under CC BY-SA 4.0)

**Side Effects:**

Vaccines, like all medical products, may cause side effects in some people. Most of these side effects are minor, such as redness or swelling at the injection site or low-grade fever and go away within a few days. Serious side effects after vaccination, such as severe allergic reaction, are very rare.

**When to vaccinate?**

On-time vaccination throughout childhood is essential because it helps provide immunity before children are exposed to potentially life-threatening diseases. Vaccines are tested to ensure that they are safe and effective for children to receive at the recommended ages. Fully vaccinated children in Ontario are protected against sixteen potentially harmful diseases.

The following chart is the recommended schedule of immunizations during childhood for the province of Ontario as of December 2016. For the most current recommendations according to the National Advisory Committee on Immunization and for each province and territory go to the **Government of Canada website.**

**Immunization Schedule**

The following is the recommended schedule of immunizations during childhood:

| Age | DTap-IPV Hib | Pneu-C-13 | Rot | Men-C | MMR | Var | Tdap-IPV | MMR-Var | Men-C-A,C,Y,W-135 | HB** | HPV | Tdap | Inf |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 m | ■ | ■ | ■ | | | | | | | | | | |
| 4 m | ■ | ■ | ■ | | | | | | | | | | |
| 6 m | ■ | | | | | | | | | | | | |
| 12 m | | ■ | | ■ | | ■ | | | | | | | |
| 15 m | | | | | | | ■ | | | | | | |
| 18 m | ■ | | | | | | | | | | | | |
| 4-6 y | | | | | | | ■ | | | | | | |
| Gr 7 | | | | | | | | | ■ | ■ | ■ | | |
| 14-16 y | | | | | | | | | | | | ■ | |
| Every year* | | | | | | | | | | | | | ■ |

m=Month; y=Year; Gr=Grade

www.aboutkidshealth.ca

\* The influenza vaccine is approved for use beginning at age 6 months.

\*\* The Hep B vaccine is approved for use beginning at birth and should be given to babies whose parents or household contacts are known Hep B carriers.

Figure 4.7: (Government of Canada, 2021)

## Descriptions of immunizations

**DTap-IPV-Hib: Diphtheria, tetanus, acellular pertussis, inactivated polio virus, haemophilus influenzae type B vaccine**

Immunization against diphtheria, tetanus, and pertussis (whooping cough) is important, since all of these diseases can be deadly. Pertussis is a serious disease, especially for young babies. Children who get pertussis can have spells of violent coughing. The cough can cause children to stop breathing for brief periods of time. The cough can last for weeks and makes it difficult for children to eat, drink and breathe. The risk of children getting pertussis increases if fewer children are immunized. The polio vaccine protects children from this now rare but crippling disease. Polio can cause nerve damage and can paralyze a person for the rest of their life. The inactivated polio vaccine is now recommended for all polio doses. Haemophilus influenzae is a type of bacteria that causes several life-threatening diseases in young children such as meningitis, epiglottitis, and pneumonia. Before the vaccine was available, a large number of children developed H. influenzae meningitis each year. Some died and others developed learning or developmental problems such as blindness, deafness, or cerebral palsy. Because of the vaccine, H. influenzae type B infection is now uncommon. The Hib vaccine does not protect against pneumonia and meningitis caused by viruses.

**Pneu-C-13: Pneumococcal conjugate (13-valent) vaccine**

Pneumococcal infections are serious bacterial infections that may cause pneumonia, bloodstream infections, and meningitis. The pneumococcal vaccine protects against the thirteen types of pneumococcal bacteria that cause most of these serious diseases. The vaccine also prevents a small percentage of ear infections caused by pneumococci. Routine use of pneumococcal vaccine is now recommended for babies and toddlers. Some older children with serious illnesses, such as sickle cell anemia, may also benefit from the vaccine.

**Rota: Rotavirus oral vaccine**

Rotavirus is a condition that causes vomiting and diarrhea. Sometimes the diarrhea is so severe, children need to be hospitalized. It is very contagious and spreads easily between children. Vaccines active against rotavirus became available at the beginning of 2006. The rotavirus vaccine is given by mouth.

**Men-C-C: Meningococcal conjugate C vaccine**

Meningococcal infections are serious bacterial infections that cause bloodstream infections or meningitis.

**MMR: Measles, mumps, and rubella vaccine**

This is a three-in-one immunization that protects against measles, mumps and rubella. It is given in infancy and then again at pre-school age.

**Var: Varicella (chickenpox) vaccine**

This vaccine is 70% to 90% effective in preventing chickenpox. If vaccinated children get chickenpox, they have a much milder form of the disease.

**Men-C-ACYW-135: Meningococcal conjugate ACYW-135 vaccine**

Students in Grade 7 are eligible to receive a single dose of this vaccine. Students who were eligible in Grade 7 and have not yet received the vaccine are eligible for a single dose of Men-C-ACYW.

**HB: Hepatitis B vaccine**

Vaccination against hepatitis B prevents this type of hepatitis and the severe liver damage that can occur 20 or 30 years after a person is first infected. A significant number of adults die each year from hepatitis-related liver cancer or cirrhosis. The younger the person is when the infection occurs, the greater the risk of serious problems. Students in Grade 7 are eligible to receive this vaccine.

**HPV: Human papillomavirus vaccine**

HPV is a virus that can lead to different types of cancers in females and males. Both males and females are eligible to receive this vaccine starting in Grade 7.

**Inf: Seasonal influenza vaccine**

Influenza is a common respiratory virus in the fall and winter. It can lead to pneumonia and hospitalization,

especially in young children and children with underlying medical conditions. All children and youth are encouraged to get the seasonal influenza vaccine.

### Other vaccines

**Hepatitis A vaccine**

The hepatitis A vaccine is recommended for children and teenagers in selected geographic regions, and for certain people at high risk. Talk to your health care provider or local public health unit for more information.

**COVID-19**

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. It spreads from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe. At the time of the writing of this text, COVID-19 vaccinations are only available in Ontario to children 5 years of age and older (World Health Organization, 2021).

## SLEEP

A newborn typically sleeps approximately 16.5 hours per 24-hour period. This is usually polyphasic sleep in that the infant is accumulating the 16.5 hours over several sleep periods throughout the day (Salkind, 2005, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). The infant is averaging 15 hours per 24-hour period by one month, and 14 hours by 6 months. By the time children turn two, they are averaging closer to 10 hours per 24 hours. Additionally, the average newborn will spend close to 50% of the sleep time in the Rapid Eye Movement (REM) phase, which decreases to 25% to 30% in childhood (Lally & Valentine-French, 2019).

**Sudden Infant Death Syndrome (SIDS)** is identified when the death of a healthy infant occurs suddenly and unexpectedly, and medical and forensic investigation findings (including an autopsy) are inconclusive. SIDS is rare before one month of age, peaks at 2 to 4 months, and is also rare after one year of age. It is estimated that it takes the life of 1 of every 2,000 live-born babies in Canada. Babies of aboriginal background are at greater risk of SIDS. It is estimated that three babies die of SIDS every week in Canada (Baby's Breath, 2016). It is difficult to get an accurate statistic on SIDS because of the definition of SIDS and the usage of different terms (ie. undetermined) that may include other causes of death. We do know that SIDS rates varies from place to place and from year to year. SIDS also occurs throughout the world.

We do not know the cause or causes of SIDS. At this time, SIDS is neither predictable nor preventable and the cause or causes of SIDS are not proven. Many researchers think that SIDS is not a single disease but rather is a result of multiple interacting factors. Current advances in medicine indicate that an underlying abnormality due to genetic, biologic or molecular disorders may be responsible for a large proportion of sudden infant deaths. At present genetic and molecular testing are not yet part of routine sudden infant death investigations carried out by the coroners or medical examiners. Restricted access to tissues from SIDs victims and limited funding for research continue to be major obstacles for progress (Baby's Breath, 2016).

While risk reduction strategies, including safe sleep practices, have helped lower the rate of SIDS in recent years, they cannot alone prevent SIDS. Risk factors are not causes. SIDS can happen to babies with known risk factors, as well as babies who have no known risk factors. It can still occur even when families and caregivers follow all recommended risk reduction strategies. The only way that we will one day be able to prevent SIDS deaths is by finding, understanding and treating the underlying biological causes of SIDS (Baby's Breath, 2016).

Indigenous Perspective

Native teachings indicate that a child is a gift from the creator and the creation of life is sacred. The following website expands on Sudden Infant Death Syndrome and Indigenous communities.  **Sudden Infant Death Syndrome and Aboriginals**

The following study includes a report on sleeping practices among Inuit Infants. **Sleep Practices among Inuit Infants and the Prevention of SIDS**

## Summary

In this chapter we looked at:

- Physical changes during the first two years
- Some common infant reflexes
- How fine and gross motor skills develop
- Sensory capacities during the first two years
- Health and safety for infants and toddlers
- The sleep needs during the first two years and ways to reduce the risk of SIDS

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**CHAPTER 5**

# Cognitive Development in Infancy and Toddlerhood

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Chapter Objectives

After this chapter, you should be able to:

- Describe the substages of the Piaget's sensorimotor stage.

- Explain how the social environment affects cognitive development according to Vygotsky's theory.

- Define classical and operant conditioning.

- Summarize the different types of memory.

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## INTRODUCTION

Infant and toddler development is rapid and complex, and cognitive development is no exception. Cognitive development includes such skills as maintaining attention, problem solving, memory and representation. You will find details of these skills and their indicators in Domain 4 in the Continuum of Development (Ontario Ministry of Education, 2014). Several theorists have contributed to our understanding of human cognition. They include: Piaget, Vygotsky, Chomsky, Skinner, Pavlov, Watson, Bandura, and Bronfenbrenner. In this chapter we will explore and analyze their perspectives.

In Chapter One, you were introduced to Jean Piaget's perspectives on human cognitive development. Piaget is the most noted theorist when it comes to children's cognitive development. He believed that children's cognition develops in stages.

He explained this growth in the following stages:

1. Sensory Motor Stage (Birth through 2 years old) with 6 substages detailed below.

2. Preoperational Stage (2-7 years old)

3. Concrete Operational Stage (7-11 years old)

4. Formal Operational Stage (12 years old- adulthood)

In this cognitive chapter we will focus on his first stage which occurs in infancy (Leon, n.d.). We will also examine more closely the aspects of his theories that apply to cognitive development during infancy and toddlerhood. These include the six substages of sensorimotor development, schemas, assimilation, accommodation, equilibrium, disequilibrium and object permanence.

Piaget was one of the first theorists to map out and describe the ways in which children's thought processes differ from those of adults. More specifically he identified that children of differing ages interpreted the world differently. He stressed that cognitive development occurs through constant interaction between their maturation and their experiences of the world. This interaction piece represented new thinking. Piaget believed that children were naturally curious. They want to make sense of their experiences, and in doing so, construct their understanding of the world. They are like scientists and construct theories about the world. Of course, these theories are often incomplete but they help them to reach more advanced levels of maturation. The theories also help to make the world more predictable. Piaget identified that knowledge and understanding moves from physical or concrete understanding of abstract thinking.

One of the mechanisms that children use to understand the world is through schemas. A schema is a psychological structure to organize information. We can think of this as a mental category or a conceptual model of interrelated events, objects or knowledge that children build as they gain experience. They learn how aspects of their world relate to each other. They collect this knowledge together in schemas which help them to navigate events and relationships. In infancy most schemas relate to their own actions….How can I control my body? How do parts of my body relate to each other? How can I use my body to manipulate objects? For example, infants eventually learn how to control their hands to interact with objects external to them. Then children's thinking and understanding increases in complexity as they learn that the world can be represented through words, gestures, objects and concepts.

## ASSIMILATION AND ACCOMMODATION

These two processes, identified by Piaget, work together. Assimilation occurs when new experiences are incorporated into the existing schemas. Infants whose schemas are about their actions may have a schema for grasping. They understand that grasping is an effective action for picking up toys, and they learn that this action also works for other things as well such as food. When they encounter a situation where the schema doesn't work, based on experience, they modify it. For example, they learn that some objects can be lifted with one hand while other objects are larger or heavier and require two hands to move them. These examples illustrate Piaget's perspective that learning occurs through interaction between maturity and their experiences of the world.

In their cognitive development children frequently encounter situations where it is simply not possible to assimilate an experience into an existing schema or category. In this situation a new schema has to be developed. Piaget used the term accommodation to describe this mental process.

Perhaps a child's family has a dog. The infant develops a schema for 'dog'. This includes information about the dog including physical characteristics such four legs, a tail, fur, the food it eats and its name. Then the child meets a neighbour's dog. The child observes that the dog does not look exactly like their family dog

and learns that it has a different name than their family pet, but they can readily make these mental adjustments and add the neighbour's dog into their schema for dogs. One day, when out on a walk in the neighbourhood the child sees a cat sunning itself in a driveway. They observe that this creature has four legs, a tail and is covered in fur and the child accessing their schema for dogs, points to the cat and says 'Dog!' The family explains that this is not a dog, but rather a cat. In this case this new information cannot be assimilated into the existing schema for dogs so a new category is created for cats. The child would add information about the characteristics of cats, the fact that they are pets, they are given names and eat special food. This is an example of accommodation. New experiences of cats and dogs will continue to be assimilated into these schemas and the child will create new schemas to organize information about other animals.

Piaget described equilibrium as a period when accommodation and assimilation are usually in balance but sometimes more time is spent on accommodating than assimilating. The balance is upset and he referred to this as disequilibrium. This occurs when outmoded ways of thinking are replaced by more advanced schemas. As far as theories, they may find a critical flaw in their theory making it no longer effective to make predictions about the world. It is time to develop a new theory. This happens at three different times over the life span at age 2, 7 and 11. Piaget identified 4 stages of cognitive development which all children go through in sequence. Each stage is marked by a distinct way of understanding the world.

## OBJECT PERMANENCE

**Object permanence** refers to the understanding that objects exist independent of one's self and one's actions. This understanding takes place over time.

- 1-4: months an object disappears from view then it no longer exists
- 8-10: understanding is incomplete...if a child sees an object under container 1 and then under container 2. The child will look under container 1 even if they can see the outline of the object under contain 2. The child does not distinguish between the actual object and the actions they used to locate it such as lifting the container.
- At 12 months: child will look for the object in several different locations
- At 18 months: they understand that an object is moved it still exists (e.g. parent tidies up toys while child is sleeping)

There have been minor revisions made to Piaget's theory, for example, Baillargeon (1987) demonstrated that infants understand objects much earlier than Piaget claimed. Some of Piaget's observations and findings could have been more about memory and not about an understanding of objects and that this understanding may occur earlier than Piaget believed. It does not mean that his theory was fundamentally wrong, just that it may need some revision.

## PIAGET AND SENSORIMOTOR INTELLIGENCE

Piaget describes intelligence in infancy as sensorimotor or based on direct, physical contact. Infants taste, feel,

pound,

push, hear, and move in order to experience the world. Let's explore the transition infants make from responding to the external world reflexively as newborns to solving problems using mental strategies as two years old. Piaget identified six substages with in the sensorimotor stage of development. These sub stages represent a distinct way of representing the world. While Piaget maintained that all children move through the stages in order, the age ages may vary from child to child. Thus, the ages listed in the table below are only approximate.

**Piaget's Six Stages of Sensorimotor Development**

| Substage | Age (months) | Accomplishments | Examples |
| --- | --- | --- | --- |
| 1 | 0-1 | Reflexes become coordinated | Sucking a nipple |
| 2 | 1-4 | Primary circular reactions appear. First learned adaptations to the world | Thumb sucking.This active learning begins with automatic movements or reflexes. A ball comes into contact with an infant's cheek and is automatically sucked on and licked. |
| 3 | 4-8 | Secondary circular reactions emerge allowing children to learn about the world | Shaking a toy to hear it rattlein being able to make things happen. Repeated motion brings particular interest as the infant is able to bang two lids together from the cupboard when seated on the kitchen floor. |
| 4 | 8-12 | Means-end sequencing develops making the onset of intentional behaviour | The infant can engage in behaviours that others perform and anticipate upcoming events. Perhaps because of continued maturation of the prefrontal cortex, the infant becomes capable of having a thought and carrying out a planned goal directed activity such as seeking a toy that has rolled under the couch.  The object continues to exist in the child's mind even when out of sight and the infant is now capable of making attempts to retrieve it. |
| 5 | 12-18 | Tertiary circular reactions appear. allowing children to experiment with new behaviours. | Shaking different toys to hear the sounds they make. |
| 6 | 18-24 | Metal representations of the world | Deferred imitation, the beginning of make-believe play<br><br>The infant more actively engages in experimentation to learn about the physical world. Gravity is learned by pouring water from a cup or pushing bowls from high chairs. The caregiver tries to help the child by picking it up again and placing it on the tray. And what happens? Another experiment! The child pushes it off the tray again causing it to fall and the caregiver to pick it up again!<br><br>The child is now able to solve problems using mental strategies, to remember something heard days before and repeat it, to engage in pretend play, and to find objects that have been moved even when out of sight. Take for instance, the child who is upstairs in a room with the door closed, supposedly taking a nap. The doorknob has a safety device on it that makes it impossible for the child to turn the knob. After trying several times in vain to push the door or turn the doorknob, the child carries out a mental strategy learned from prior experience to get the door opened-he knocks on the door! The child is now better equipped with mental strategies for problem-solving. |

Table 5.1: Piaget's Six Stages of Sensorimotor Development (Paris, Ricardo, Raymond, & Johnson, 2021)

## EVALUATING PIAGET'S SENSORIMOTOR STAGE

Piaget opened up a new way of looking at infants with his view that their main task is to coordinate their sensory impressions with their motor activity. However, the infant's cognitive world is not as neatly packaged as Piaget portrayed it, and some of Piaget's explanations for the cause of change are debated. In the past several decades, sophisticated experimental techniques have been devised to study infants, and there have been a large number of many research studies on infant development. Much of the new research suggests that Piaget's view of sensorimotor development needs to be modified (Baillargeon, 2014; Brooks & Meltzoff, 2014; Johnson & Hannon, 2015, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## OBJECT PERMANENCE

One necessary modification would be when children develop object permanence. Infants seem to be able to recognize that objects have permanence at much younger ages than Piaget proposed (even as young as 3.5 months of age).

## THE A-NOT-B ERROR

The data collected in more contemporary research (see examples below) does not always support Piaget's claim that certain processes are crucial in transitions from one stage to the next. For example, in Piaget's theory, an important feature in the progression into substage 4, coordination of secondary circular reactions, is an infant's inclination to search for a hidden object in a familiar location rather than to look for the object in a new location. Thus, if a toy is hidden twice, initially at location A and subsequently at location B, 8- to 12-month-old infants search correctly at location A initially. But when the toy is subsequently hidden at location B, they make the mistake of continuing to search for it at location A. A-not B error is the term used to describe this common mistake. Older infants are less likely to make the A-not-B error because their concept of object permanence is more complete. Researchers have found, however, that the A-not B error does not show up consistently (Sophian, 1985, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). The evidence indicates that A-not-B errors are sensitive to the delay between hiding the object at B and the infant's attempt to find it (Diamond, 1985, as cited in Paris, Ricardo, Raymond, & Johnson, 2020). Thus, the A-not-B error might be due to a failure in memory. Another explanation is that infants tend to repeat a previous motor behaviour (Clearfield & others, 2006; Smith, 1999, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## VYGOTSKY: DEVELOPMENT IS DETERMINED BY ENVIRONMENTAL FACTORS

Piaget certainly developed many theories during his career, but they have also received a great deal of criticism. Many believe that Piaget ignored the significant influence that society and culture have in shaping a child's development. Lev Vygotsky (1896–1934), another child development researcher working at the same time as Piaget. He had come to similar conclusions as Piaget about children's development, in thinking that children learned about the world through physical interaction with it. However, where Piaget felt that children moved naturally through different stages of development, based on biological predispositions and their own individual interactions with the world, Vygotsky claimed that adult or peer intervention was a much more important part of the developmental process. Vygotsky concentrated more on the child's immediate social and cultural environment and his or her interactions with adults and peers. He argued that development occurred first through children's immediate social interactions, and then moved to the individual level as they began to internalize their learning. While Piaget saw the child as actively discovering the world through individual interactions with it, Vygotsky saw the child as more of an apprentice, learning through a social environment of others who had more experience and were sensitive to the child's needs and abilities (Leon, n.d.).

When infants, children and adults are presented with a strong or unfamiliar stimulus, an orienting response usually occurs. The person reacts, looks at the stimulus and experiences changes in heart rate and brain wave activity. These indicate that the person has noticed the stimulus. After repeated presentations they become familiar with it and the response disappears. This is referred to as habituation. For newly born infants everything in their environment is unfamiliar, the doorbell, the dog barking, the television as examples. The infant may react to these stimuli, however, within a few days an infant may appear to hardly notice them. This means they have become accustomed to them.

Dishabituation occurs when a person becomes actively aware of the stimulus again. Orientation is important to keep us safe, but constantly responding to an insignificant stimulus is unnecessary so habituation keeps infants from wasting energy on insignificant events (Rovee-Collier, 1987). An infant may start to lose interest in playing peek a boo, but if you change the object that is hiding or the expression on your face they may become interested again.

## THEORIES OF COGNITIVE DEVELOPMENT, LEARNING AND MEMORY

### Pavlov

Ivan Pavlov (1880-1937) was a Russian physiologist interested in studying digestion. As he recorded the amount of salivation his laboratory dogs produced as they ate, he noticed that they actually began to salivate before the food arrived as the researcher walked down the hall and toward the cage. The dogs knew that the food was coming because they had learned to associate the footsteps with the food. The keyword here is "learned". A learned response is called a "conditioned" response.

Pavlov began to experiment with this "psychic" reflex. He began to ring a bell, for instance, prior to introducing the food. Sure enough, after making this connection several times, the dogs could be made to salivate to the sound of a bell. Once the bell had become an event to which the dogs had learned to salivate, it was called a conditioned stimulus. The act of salivating to a bell was a response that had also been learned, now termed in Pavlov's jargon, a conditioned response.

Notice that the response, salivation, is the same whether it is conditioned or un conditioned (unlearned or natural). What changed is the stimulus to which the dog salivates. One is natural (unconditioned) and one is learned (conditioned).
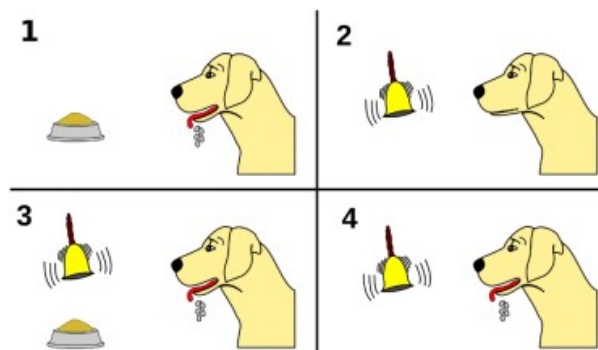


Figure 5.1: Pavlov's experiments with dogs and conditioning. (Image by Maxxl² is licensed under CC BY-SA 4.0)

Let's think about how classical conditioning is used on us. One of the most widespread applications of classical conditioning principles was brought to us by the psychologist, John B. Watson (Leon, n.d.).

## Classical Conditioning

Classical conditioning is a form of learning whereby a conditioned stimulus (CS) becomes associated with an unrelated unconditioned stimulus (US), in order to produce a behavioural response known as a conditioned response (CR). The conditioned response is the learned response to the previously neutral stimulus. The unconditioned stimulus is usually a biologically significant stimulus such as food or pain that elicits an unconditioned response (UR) from the start. The conditioned stimulus is usually neutral and produces no particular response at first, but after conditioning, it elicits the conditioned response.

If we look at Pavlov's experiment, we can identify these four factors at work:

- The unconditioned response was the salivation of dogs in response to seeing or smelling their food. The unconditioned stimulus was the sight or smell of the food itself.

- The conditioned stimulus was the ringing of the bell. During conditioning, every time the animal was given food, the bell was rung. This was repeated during several trials. After some time, the dog learned to associate the ringing of the bell with food and to respond by salivating.

- After the conditioning period was finished, the dog would respond by salivating when the bell was rung, even when the unconditioned stimulus (the food) was absent.

- The conditioned response, therefore, was the salivation of the dogs in response to the conditioned stimulus (the ringing of the bell) (Leon, n.d.).

## Neurological Response to Conditioning

Consider how the conditioned response occurs in the brain. When a dog sees food, the visual and olfactory stimuli send information to the brain through their respective neural pathways, ultimately activating the salivary glands to secrete saliva. This reaction is a natural biological process as saliva aids in the digestion of food. When a dog hears a buzzer and at the same time sees food, the auditory stimuli activate the associated neural pathways. However, since these pathways are being activated at the same time as the other neural pathways, there are weak synapse reactions that occur between the auditory stimuli and the behavioural response. Over time, these synapses are strengthened so that it only takes the sound of a buzzer to activate the pathway leading to salivation.

## Operant Conditioning

Operant conditioning is a theory of behaviourism, a learning perspective that focuses on changes in an individual's observable behaviours. In operant conditioning theory, new or continued behaviours are impacted by new or continued consequences. Research regarding this principle of learning was first studied by Edward L. Thorndike in the late 1800's, then brought to popularity by B.F. Skinner in the mid-1900's. Much of this research informs current practices in human behaviour and interaction.

## Skinner's Research

Thorndike's initial research was highly influential on another psychologist, B.F. Skinner. Almost half a century after Thorndike's first publication of the principles of operant conditioning, Skinner attempted to prove an extension to this theory—that all behaviours were in some way a result of operant conditioning. Skinner theorized that if a behaviour is followed by reinforcement, that behaviour is more likely to be repeated, but if it is followed by punishment, it is less likely

to be repeated. He also believed that this learned association could end, or become extinct if the reinforcement or punishment was removed. To prove this, he placed rats in a box with a lever that when tapped would release a pellet of food. Over time, the amount of time it took for the rat to find the lever and press it became shorter and shorter until finally, the rat would spend most of its time near the lever eating. This behaviour became less consistent when the relationship between the lever and the food was compromised. This basic theory of operant conditioning is still used by psychologists, scientists, and educators today.

## Shaping, Reinforcement Principles, and Schedules of Reinforcement

Operant conditioning can be viewed as a process of action and consequence. Skinner used this basic principle to study the possible scope and scale of the influence of operant conditioning on animal behaviour. His experiments used shaping, reinforcement, and reinforcement schedules in order to prove the importance of the relationship that animals form between behaviours and results. All of these practices concern the setup of an experiment. Shaping is the conditioning paradigm of an experiment. The form of the experiment in successive trials is gradually changed to elicit a desired target behaviour. This is accomplished through reinforcement, or reward, of the segments of the target behaviour, and can be tested using a large variety of actions and rewards. The experiments were taken a step further to include different schedules of reinforcement that become more complicated as the trials continued. By testing different reinforcement schedules, Skinner learned valuable information about the best ways to encourage a specific behaviour, or the most effective ways to create a long-lasting behaviour. Much of this research has been replicated on humans, and now informs practices in various environments of human behaviour (Leon, n.d.).

## Positive and Negative Reinforcement

Positive reinforcement involves adding something to the situation in order to encourage a behaviour. Other times, taking something away from a situation can be reinforcing. For example, the loud, annoying buzzer on your alarm clock encourages you to get up so that you can turn it off and get rid of the noise. Children whine in order to get their parents to do something and often, parents give in just to stop the whining. In these instances, negative reinforcement has been used.

**Operant Conditioning**

| **Reinforcement**<br>Increase Behavior | | **Punishment**<br>Decrease Behavior | |
|---|---|---|---|
| **Positive**<br>Add appetitive stimulus<br>following correct behavior<br>*Giving a treat when the dog sits* | **Negative**<br>Remove or avoid<br>noxious stimuli<br>*Turning the alarm clock off* | **Positive**<br>Add noxious stimuli<br>following behavior<br>*Scolding a child for not sharing* | **Negative**<br>Remove appetitive behavior<br>following behavior<br>*Turning the alarm clock off* |

Figure 5.2:  Reinforcement in operant conditioning. (Image by Curtis Neveu is licensed under CC BY-SA 3.0 and Modified from source image)

Operant conditioning tends to work best if you focus on trying to encourage a behaviour or move a person into the direction you want them to go rather than telling them what not to do. **Reinforcers** are used to encourage a behaviour; punishers are used to stop behaviour. A punisher is anything that follows an act and decreases the chance it will reoccur. But often a punished behaviour doesn't really go away. It is just suppressed and may reoccur whenever the threat of punishment is removed.

Perhaps a family feels very strongly about swearing and the children have lost privileges such as a special treat or an outing because they have used inappropriate language in the house. However, when the children are with their peers and out of earshot they frequently use swearwords in their speech.

Think of human behaviour in general. Many drivers, including those who have received speeding tickets in the past, go over the posted speed limit and are more likely to do this if they do not perceive the presence of police or a device to monitor speed.

Another problem with punishment is that when a person focuses on punishment, they may find it hard to see what the other does right or well. And punishment is stigmatizing; when punished, some start to see themselves as bad and give up trying to change.

Reinforcement can occur in a predictable way, such as after every desired action is performed, or intermittently, after the behaviour is performed a number of times or the first time it is performed after a certain amount of time. The schedule of reinforcement has an impact on how long a behaviour continues after reinforcement is discontinued. So a parent who has rewarded a child's actions each time may find that the child gives up very quickly if a reward is not immediately forthcoming. Think about the kinds of behaviours that may be learned through classical and operant conditioning. But sometimes very complex behaviours are learned quickly and without direct reinforcement. Bandura's Social Learning covered later in the chapter explains how.

## Watson and Behaviourism

Another theorist who added to the spectrum of the behavioural movement was John B. Watson. Watson believed that most of our fears and other emotional responses are classically conditioned. He had gained a good deal of popularity in the 1920s with his expert advice on parenting offered to the public. He believed that parents could be taught to help shape their children's behaviour and tried to demonstrate the power of classical conditioning with his famous experiment with an 18-month-old boy named "Little Albert". Watson sat Albert down and introduced a variety of seemingly scary objects to the child: a burning piece of newspaper, a white rat, etc. But Albert remained curious and reached for all of these things. Watson knew that one of our only inborn fears is the fear of loud noises so he proceeded to make a loud noise each time he introduced one of Albert's favourites, a white rat. After hearing the loud noise several times paired with the rat, Albert soon came to fear the rat and began to cry when it was introduced.

Watson filmed this experiment for posterity and used it to demonstrate that he could help parents achieve any outcomes they desired, if they would only follow

his advice. Watson wrote columns in newspapers and in magazines and gained a lot of popularity among parents eager to apply science to household order. Parenting advice was not the legacy Watson left us, however. Where he really made his impact was in advertising. After Watson left academia, he went into the world of business and showed companies how to tie something that brings about a natural positive feeling to their products to enhance sales. For example, in advertising products are often intentionally aligned with images of attractive models engaging in appealing activities. Sometimes we do things because we've seen it pay off for someone else. They were operantly conditioned, but we engage in the behaviour because we hope it will pay off for us as well. This is referred to as vicarious reinforcement (Bandura, Ross and Ross, 1963, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).



Figure 5.3: A photograph taken during Little Albert research. (Image is in the public domain)

**Do parents socialize children or do children socialize parents?**

Bandura (1986) suggests that there is interplay between the environment and the individual. We are not just the product of our surroundings, rather we influence our surroundings. There is interplay between our personality and the way we interpret events and how they influence us. This concept is called reciprocal determinism. An example of this might be the interplay between parents and children. Parents not only influence their child's environment, perhaps intentionally through the use of reinforcement, etc., but children influence parents as well. Parents may respond differently with their first child than with their fourth. Perhaps they try to be the perfect parents with their firstborn, but by the time their last child comes along they have very different expectations both of themselves and their child. Our environment creates us and we create our environment.

## Goodness of fit



Figure 5.4: A smiling infant playing with toys. (Image by OmarMedinaFilms on Pixabay)

A child's temperament will influence how the caregivers respond to them. Thomas, Chess, & Birch (1985) identified three temperaments – easy, difficult and slow to warm up.

Goodness of fit is a term borrowed from statistics to describe the compatibility between a person's temperament and their surrounding environment. There are two aspects involved: how the trait interacts with the environment and how it interacts with the people in that environment. Any trait itself is not a problem, but it is the degree to which that trait is accepted that determines the goodness of fit. When the child's temperament, skills and abilities match the expectations of the environment well this supports success and positive self-esteem. Difficulties can result when there is not a good fit. Examples: a naturally active child who lives in a small apartment compared to a child who lives in a larger home with a large back yard (Center for Parenting Education, n.d.).

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**Indigenous Perspective**

A toddler's responsibility is about safety. As they explore the world around them, they like touching everything; hence learning through their interactions with the environment. Indigenous children are encouraged to explore the environment around them; especially outdoors to further their connection to the land.

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When it comes to the fit with people in the child's world, sometimes it is challenging for families, caregivers and educators to understand traits which differ greatly from themselves or traits which remind them about aspects of themselves that they do not like or that have been problematic in their lives. Examples: a child who does not enjoy physical activity in a family that does or a child who has a slow to warm up temperament (Thomas, Chess & Birch, 1985) in a family where members are very social and enjoy parties and social gatherings.

## Social Learning Theory

Albert Bandura is a leading contributor to social learning theory. He calls our attention to the ways in which many

of our actions are not learned through conditioning; rather, they are learned by watching others. Young children frequently learn behaviours through imitation. Sometimes, particularly when we do not know what else to do, we learn by modelling or copying the behaviour of others. A new employee, on his or her first day of a new job might eagerly look at how others are acting and try to act the same way to fit in more quickly. Adolescents struggling with their identity rely heavily on their peers to act as role-models. Newly married couples often rely on roles they may have learned from their parents and begin to act in ways they did not while dating and then wonder why their relationship has changed.

## MEMORY AND ATTENTION

If we want to remember something tomorrow, we have to consolidate it into long-term memory today. Long-term memory is the final, semi-permanent stage of memory. Unlike sensory and short-term memory, long-term memory has a theoretically infinite capacity, and information can remain there indefinitely. Long-term memory has also been called reference memory, because an individual must refer to the information in long-term memory when performing almost any task. Long-term memory can be broken down into two categories: explicit and implicit memory.

### Explicit Memory

Explicit memory, also known as conscious or declarative memory, involves memory of facts, concepts, and events that require conscious recall of the information. In other words, the individual must actively think about retrieving the information from memory. This type of information is explicitly stored and retrieved—hence its name. Explicit memory can be further subdivided into semantic memory, which concerns facts, and episodic memory, which concerns primarily personal or autobiographical information.

### Episodic Memory

Episodic memory is used for more contextualized memories. They are generally memories of specific moments, or episodes, in one's life. As such, they include sensations and emotions associated with the event, in addition to the who, what, where, and when of what happened. An example of an episodic memory would be recalling your family's trip to the beach. Autobiographical memory (memory for particular events in one's own life) is generally viewed as either equivalent to or a subset of episodic memory. One specific type of autobiographical memory is a flashbulb memory, which is a highly detailed, exceptionally vivid "snapshot" of the moment and circumstances in which a piece of surprising and consequential (or emotionally arousing) news was heard. For example, many people remember exactly where they were and what they were doing when they heard of the terrorist attacks on September 11, 2001. This is because it is a flashbulb memory.

Semantic and episodic memory are closely related; memory for facts can be enhanced with episodic memories associated with the fact, and vice versa. For example, the answer to the factual question "Are all apples red?" might be recalled by remembering the time you saw someone eating a green apple. Likewise, semantic memories about certain topics, such as football, can contribute to more detailed episodic memories of a particular personal event, like watching a football game. A person that barely knows the rules of football will

remember the various plays and outcomes of the game in much less detail than a football expert.

## Implicit Memory

In contrast to explicit (conscious) memory, implicit (also called "unconscious" or "procedural") memory involves procedures for completing actions. These actions develop with practice over time. Athletic skills are one example of implicit memory. You learn the fundamentals of a sport, practice them over and over, and then they flow naturally during a game. Rehearsing for a dance or musical performance is another example of implicit memory. Everyday examples include remembering how to tie your shoes, drive a car, or ride a bicycle. These memories are accessed without conscious awareness—they are automatically translated into actions without us even realizing it. As such, they can often be difficult to teach or explain to other people. Implicit memories differ from the semantic scripts described above in that they are usually actions that involve movement and motor coordination, whereas scripts tend to emphasize social norms or behaviours.



Figure 5.5:  A toddler walking. (Image on Public Domain Pictures)

## Short-Term Memory Storage

Short-term memory is the ability to hold information for a short duration of time (on the order of seconds). In the process of encoding, information enters the brain and can be quickly forgotten if it is not stored further in the short-term memory. George A. Miller (n.d., as cited in Paris, Ricardo, Raymond, & Johnson, 2021) suggested that the capacity of short-term memory storage is approximately seven items plus or minus two, but modern researchers are showing that this can vary depending on variables like the stored items' phonological properties. When several elements (such as digits, words, or pictures) are held in short-term memory simultaneously, their representations compete with each other for recall, or degrade each other. Thereby, new content gradually pushes out older content, unless the older content is actively protected against interference by rehearsal or by directing attention to it.

   Information in the short-term memory is readily accessible, but for only a short time. It continuously decays, so in the absence of rehearsal (keeping information in short-term memory by mentally repeating it) it can be forgotten.
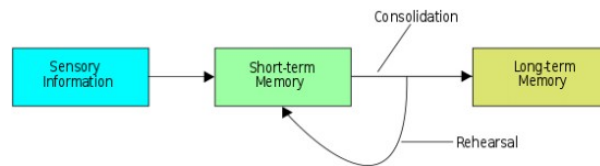
Figure 5.6: Diagram of the memory storage process. (Image by Wikipedia is licensed under CCBY-SA3.0)

## Long-Term Memory Storage

In contrast to short-term memory, long-term memory is the ability to hold semantic information for a prolonged period of time. Items stored in short-term memory move to long-term memory through rehearsal, processing, and use. The capacity of long-term memory storage is much greater than that of short-term memory, and perhaps unlimited. However, the duration of long-term memories is not permanent; unless a memory is occasionally recalled, it may fail to be recalled on later occasions. This is known as forgetting.

Long-term memory storage can be affected by traumatic brain injury or lesions. Amnesia, a deficit in memory, can be caused by brain damage. Anterograde amnesia is the inability to store new memories; retrograde amnesia is the inability to retrieve old memories. These types of amnesia indicate that memory does have a storage process (Leon, n.d.).

## Information Processing theory

Infants learn to process information fairly quickly. When they are first brought home, everything is new and startling: the family dog, the doorbell, the television as examples. However, within a few days the infant may hardly seem to notice them and may even sleep through such sounds. They have learned to ignore sounds which had once startled them. This capacity helps to reduce stress and preserve energy for other tasks.

## Information Processing Approach

This is an approach to human cognition which makes a distinction between computer hardware and computer software. This approach arose in the 1960s and is now considered a useful one to explain human cognition (Kail & Bisanz, 1992, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

This approach sees human thinking as based on both mental hardware and mental software.

Mental hardware refers to neural structures that are built in and allow the mind to operate. Mental hardware has three components: sensory memory, working memory and long-term memory.

Sensory memory refers to information which is held in a raw and unanalyzed form, literally for a few seconds.

Working memory is the site of ongoing cognitive activity. Some theorists compare this to a carpenter's bench where there is space for storing materials as well as space to work with them (sawing, nailing, gluing etc.) (Klatzky, 1980).

Long term memory refers to the limitless, permanent storage of knowledge of the world. It is like a computer's hard drive. Our long term memory stores facts (Ottawa is the capital of Canada), personal information (my neighbours have a new dog), and skills (how to ride a bike).

## Some researchers have noted other forms of memory which include:

- procedural memory which is memory of how to do things

- semantic memory which is memory for particular facts

- autobiographical memory which is memory for specific events which have occurred for an individual.

### Infantile Amnesia

While memory begin in infancy, children, adolescents and adults report remembering little from the first few years of life (Kail, 1990) What is your earliest memory? Do you truly remember this or is it more about having heard family members speak about it? If you recall a memory from when you were around three or four years of age then you have a typical capacity to remember memory (for example Eacott,1999). Most individuals are unable to report a memory form before this age. This inability to remember events from early in one's life is referred to as infantile amnesia. Very early memories of events may arise because we have heard others speak of them or from seeing images such as photographs for videos.

### Explaining Infantile Amnesia

**Language Acquisition:** There is a significant language component to memory where language is used to represent past events (Nelson, 1993, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Events which occurred in a prelingual stage may be difficult for an individual to retrieve.
Sense of self: It takes time for children's sense of self to develop. Children under the age of three years may not yet an organized sense of self which acts as a framework for organizing memories of events from their own live (Harley & Reese, 1999; Howe & Courage, 1997, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

**Culture:** Other research (e.g. Wang, Conway & Hou, 2007) has identified a cultural component in experiences of infantile amnesia. These researchers found that in cultures which have a relational sense of self such as Chinese cultures where collective identities are valued, individuals tended to have longer periods of infantile amnesia. In contrast cultures that promote autonomy and an individualized sense of self, tend to see shorter periods of infantile amnesia and individuals reporting more early childhood memories.

**Early memories:** It is a common practice in many societies to practice family planning and space the birth of children. This often results in a child becoming a sibling for the first time between the ages of two and three years of age. The birth of a sibling is often reported as a dramatic event in one's life and the 'bringing home' of a sibling is a commonly reported first memory. The event is dramatic, and the timing may align the development language and a sense of self, the conditions for organizing memories.

## Summary

In this chapter we looked at:

- Piaget's sensorimotor stage.

- The impact of the social environment on children's learning.

- The progression and theories of language development.

- Classical and operant conditioning and systems of reinforcement.

- The types of memory and how they work together.

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**CHAPTER 6**

## *Social Development in Infancy and Toddlerhood*

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### Chapter Objectives

After this chapter, you should be able to:

- Describe the continuum of development of social skills in infants and toddlers.
- Compare different theories of attachment and attachment styles.
- Explain Erikson's stage of trust versus mistrust.
- Recognize cultural variations in socialization.

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## INTRODUCTION

The early interactions we have with the adults that care for us as infants and toddlers are very important for the healthy development of social relationships. Let's examine some of the important interactions in social development during the first two years of life.

## CONTINUUM OF DEVELOPMENT

The Continuum of Development set out in Early Learning for *Every Child Today: A framework for Ontario early childhood settings* (2007) identifies several root social skills that are emerging in children from birth to approximately 3 years of age (Ontario Ministry of Education, 2014).

Infants (birth to 24 months of age) show emerging interest in social interactions. For example, they prefer human faces over inanimate objects. They will engage with adults by making eye contact, smiling, and reaching their arms out to indicate they want to be picked up. They begin to imitate adult behavior and engage in simple pretend play. Older infants can play simple games that involve taking turns. As they become more mobile, infants become capable of maintaining a social connection when the adult is not physically close by.

Figure 6.1: Father and child social interactions in infancy. (Photo by Zach Vessels on Unsplash)

Toddlers (14 months to 3 years) build on the skills that emerged during infancy and start practicing some new skills. They begin to imitate their peers as well as adults. The ability to see a situation from another's point of view starts to emerge. This enables toddlers to start to engage in parallel play.



Figure 6.2: Toddlers engaging in parallel play. (Image from Unsplash)

## FORMING ATTACHMENTS

**Attachment** is the close bond with a caregiver from which the infant derives a sense of security. The formation of attachments in infancy has been the subject of considerable research as attachments have been viewed as foundations for future relationships. Additionally, attachments form the basis for confidence and curiosity as toddlers, and as important influences on self-concept.



Figure 6.3: The formation of an attachment relationship (Photo by Marcin Jozwiak on Unsplash)

## Freud's Psychoanalytic Theory

According to Freud (1938, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) infants are oral creatures who obtain pleasure from sucking and mouthing objects. Freud believed the infant will become attached to a person or object that provides this pleasure. Consequently, infants were believed to become attached to their mother because they were the one who satisfied their oral needs and provided pleasure. Freud further believed that the infants will become attached to their mothers "if the mother is relaxed and generous in their feeding practices, thereby allowing the child a lot of oral pleasure" (Shaffer, 1985, p. 435, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## Harlow's Research

In one classic study, Wisconsin University psychologists Harry and Margaret Harlow investigated the responses of young rhesus monkeys to explore if breastfeeding was the most important factor to attachment.



Figure 6.4: Rhesus monkey sucking its thumb. (Image by splotter_nl is licensed under CC BY 2.0)

Infant monkeys were separated from their biological mothers, and two inanimate surrogate mothers were introduced to their cages. The first inanimate surrogate (the wire mother) consisted of a round wooden head, a mesh of cold metal wires, and a bottle of milk from which the baby monkey could drink. The second Inanimate surrogate was a foam-rubber form wrapped in a heated terry-cloth blanket. The infant monkeys went to the wire "mother" for food, but they overwhelmingly preferred and spent significantly more time with the warm terry-cloth "mother." The warm terry-cloth "mother" provided no food but did provide comfort (Harlow, 1958, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). The infant's need for physical closeness and touching is referred to as **contact comfort**. Contact comfort is believed to be the foundation for attachment. The Harlows' studies confirmed that babies have social as well as physical needs. Both monkeys and human babies need a secure base that allows them to feel safe. From this base, they can gain the confidence they need to venture out and explore their worlds.

## Bowlby's Theory

Building on the work of Harlow and others, John Bowlby developed the concept of attachment theory. He defined attachment as the affectional bond or tie that an infant forms with the mother. An infant must form this bond with a primary caregiver in order to have normal social and emotional development. In addition, Bowlby proposed that this attachment bond is very powerful and continues throughout life. He used the concept of a secure base to define a healthy attachment between parent and child (Bowlby, 1982, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). A secure base is a parental presence that gives the child a sense of safety as the child explores the surroundings.



Figure 6.5: A mother offering a secure base as their infant plays on a slide. (Image is licensed under CC0)

Bowlby said that two things are needed for a healthy attachment; the caregiver must be responsive to the child's physical, social, and emotional needs; and the caregiver and child must engage in mutually enjoyable interactions (Bowlby, 1969, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Additionally, Bowlby observed that infants would go to extraordinary lengths to prevent separation from their parents, such as crying, refusing to be comforted, and waiting for the caregiver to return.



Figure 6.6: This child is seeking comfort from an attachment figure. (Image on Pexels)

Bowlby also observed that these same expressions were common to many other mammals, and consequently argued that these negative responses to separation serve an evolutionary function. Because mammalian infants

cannot feed or protect themselves, they are dependent upon the care and protection of adults for survival. Thus, those infants who were able to maintain proximity to an attachment figure were more likely to survive and reproduce.

## Erikson: Trust versus Mistrust

As previously discussed in Chapter 1,  Erik Erikson formulated an eight-stage theory of psychosocial development. Erikson was in agreement on the importance of a secure base, arguing that the most important goal of infancy was the development of a basic sense of trust in one's caregivers. Consequently, the first stage, trust versus mistrust, highlights the importance of attachment. Erikson maintained that the first year to year and a half of life involves the establishment of a sense of trust (Erikson, 1982, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Infants are dependent and must rely on others to meet their basic physical needs as well as their needs for stimulation and comfort. A caregiver who consistently meets these needs instills a sense of trust or the belief that the world is a trustworthy place. The caregiver should not worry about over indulging a child's need for comfort, contact or stimulation.



Figure 6.7: This baby-wearing father is creating trust with his infant. (Image on Unsplash)



Figure 6.8: Intergenerational relationships and the development of trust. (Image on Unsplash)

## Attachment Relationships in Indigenous Families

Parenting styles in Canada's Indigenous cultures, First Nations, Metis and Inuit, are similar in some ways and differ in other ways. Values held in common include: a holistic approach to development, balance and respect. The Western view of the caregiver-child attachment relationship tends to focus on the child's primary caregiver. In Indigenous cultures, a child is connected to their immediate family, extended family, community, and ancestors. All of these relationships are seen to be equally important.

## Challenges to Establishing Trust

Erikson (1982, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) believed that mistrust could contaminate all aspects of one's life and deprive the individual of love and fellowship with others. Consider the implications for establishing trust if a caregiver is unavailable or is upset and ill-prepared to care for a child. Or if a child is born prematurely, is unwanted, or has physical differences that make them more challenging to parent. Under these circumstances, we cannot assume that the parent is going to provide the child with a feeling of trust.

The residential school system and the child protection system in Canada have had a profound and long-lasting effect on Indigenous people. Children who were removed from their families and raised in foster care or a residential school have become parents and grandparents. As children, they were subject to abuse, loss and trauma. As a result of this trauma, they are more likely to have difficulty forming healthy attachments as adults (Hardy & Bellamy, 2013).

## Mary Ainsworth and the Strange Situation

Developmental psychologist Mary Ainsworth, a student of John Bowlby, continued studying the development of attachment in infants. Ainsworth and colleagues created a laboratory test that measured an infant's attachment to their parent. The test is called **The Strange Situation** because it is conducted in a context that is unfamiliar to the child and therefore likely to heighten the child's need for their parent (Ainsworth, 1979, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).



Figure 6.9: An infant crawling on the floor with toys around as done in the Strange Situation. (Image is in the public domain)

During the procedure, which last about 20 minutes, the parent and the infant are first left alone, while the infant explores the room full of toys. Then a strange adult enters the room and talks for a minute to the parent, after which the parent leaves the room. The stranger stays with the infant for a few minutes, and then the parent again enters and the stranger leaves the room. During the entire session, a video camera records the child's behaviours. Which are later coded by the research team. The investigators were especially interested in how the

child responded to the caregiver leaving and returning to the room, referred to the "reunion". On the basis of their behaviours, the children are categorized into one of four groups where each group reflect a different kind of attachment relationship with the caregiver. One style is secure and the other three styles are referred to as insecure.

- A child with a **secure attachment** style usually explores freely while the caregiver is present and may engage with the stranger. The child will typically play with the toys and bring one to the caregiver to show and describe from time to time. The child may be upset when the caregiver departs but is also happy to see the caregiver return.

- A child with an **ambivalent** (sometimes called resistant) **attachment style** is wary about the situation in general, particularly the stranger, and stays close or even clings to the caregiver rather than exploring the toys. When the caregiver leaves, the child is extremely distressed and is ambivalent when the caregiver returns. The child may rush to the caregiver, but then fails to be comforted when picked up. The child may still be angry and even resist attempts to be soothed.

- A child with an **avoidant attachment style** will avoid or ignore the mother, showing little emotion when the mother departs or returns. The child may run away from the mother as they approach the child. The child will not explore very much, regardless of who is there, and the stranger will not be treated much differently from the mother.

- A child with a **disorganized/disoriented attachment style** seems to have an inconsistent way coping with the stress of the strange situation. The child may cry during the separation, but avoid the mother upon return. Or the child may approach the mother but then freeze or fall to the floor.

How common are attachment styles among children? In Canada, attachment disorders are uncommon in the general population (under 1%). That increases to possibly 40% for children who are exposed to gross maltreatment or poor-quality institutionalization (Atkinson & Beiser, 2016).

   Keep in mind that methods for measuring attachment styles have been based on a model that reflects middle-class, Western values. New methods for assessing attachment styles involve using a **Q-sort technique** in which a large number of behaviours are recorded on cards and the observer sorts the cards in a way that reflects the type of behavior that occurs within the situation (Waters, 1987, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). There are 90 items in the third version of the Q-sort technique, and examples of the behaviors assessed include:

- When the child returns to the mother after playing, the child is sometimes fussy for no clear reason.

- When the child is upset or injured, the child will accept comfort from adults other than the mother.

- Child often hugs or cuddles against the mother, without the mother asking or inviting the child to do so.

- When the child is upset by their mother's leaving, the child continues to cry or even gets angry after the mother is gone.

At least two researchers observe the child and parent in the home for 1.5-2 hours per visit. Usually, two visits are sufficient to gather adequate information. The parent is asked if the behaviors observed are typical for the child. This information is used to test the validity of the Strange Situation classifications across age, cultures, and with clinical populations.

## Caregiver Consistency

Having a consistent caregiver may be jeopardized if the infant is cared for in a child care setting with a high turnover of staff or if institutionalized and given little more than basic physical care.

Infants who, perhaps because of being in orphanages with inadequate care, have not had the opportunity to attach in infancy may still form initial secure attachments several years later. However, they may be more likely to experience depression and anger or be overly friendly as they interact with others (O'Connor et. al., 2003, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## Social Deprivation

Severe deprivation of parental attachment can have serious consequences for development across developmental domains. According to studies of children who have not been given warm, nurturing care, they may show developmental delays, failure to thrive and attachment disorders (Bowlby, 1982, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). **Non-organic failure to thrive** is the diagnosis for an infant who does not grow, develop, or gain weight on schedule. In addition, postpartum depression can cause even a well-intentioned mother to neglect their infant.

## Reactive Attachment Disorder

Children who experience social neglect or deprivation, repeatedly change primary caregivers that limit opportunities to form stable attachments, or are reared in unusual settings (such as institutions) that limit opportunities to form stable attachments can certainly have difficulty form attachments. According to the Diagnostic and Manual of Mental Disorders, 5th edition (American Psychiatric Association, 2013) those children experiencing neglectful situations and also displaying markedly disturbed and developmentally inappropriate attachment behaviour, such as being inhibited and withdrawn, minimal social and emotional responsiveness to others, and limited positive affect, may be diagnosed with **Reactive Attachment Disorder**. This disorder often occurs with developmental delays, especially in cognitive and language areas. Fortunately, the majority of severely neglected children do not develop Reactive Attachment Disorder, which occurs in less than 10% of such children. The quality of the caregiving environment after serious neglect affects the development of this disorder.

## Resiliency

Being able to overcome challenges and successfully adapt is **resiliency**. Even young children can exhibit strong resilience to harsh circumstances. Resiliency can be attributed to certain personality factors, such as an easy-going temperament. Some children are warm, friendly, and responsive, whereas others tend to be more irritable, less manageable, and difficult to console, and these differences play a role in attachment (Gillath, Shaver, Baek, & Chun, 2008; Seifer, Schiller, Sameroff, Resnich, & Riordan, 1996, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). It seems safe to say that attachment, like most other developmental processes, is affected by an inter play of genetic and socialization influences.

Receiving support from others also leads to resiliency. A positive and strong support group can help a parent and child build a strong foundation by offering assistance and positive attitudes toward the newborn and parent. In a direct test of this idea, Dutch researcher van den Boom (1994, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) randomly assigned some babies/mothers to a training session in which they learned to better respond to their children's needs. The research found that these mothers' babies were more likely to show a secure attachment style in comparison the other mothers in a control group that did not receive training (Lally & Valentine-French, 2019).

Figure 6.10: This infant massage class for new mothers could provide training and support for mothers.
(Image is in the public domain)

## CULTURAL VARIATIONS

The term **culture** refers to all of the beliefs, customs, ideas, behaviours, and traditions of a particular society that are passed through generations. Culture is transmitted to people through language as well as through the modeling of behaviour, and it defines which traits and behaviours are considered important, desirable, or undesirable.

Some cultural differences in attachment styles have been found (Rothbaum, Weisz, Pott, Miyake, & Morelli, 2010, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). For example, German parents value independence and Japanese mothers are typically by their children's sides. As a result, the rate of insecure-avoidant attachments is higher in Germany and insecure-resistant attachments are higher in Japan. These differences reflect cultural variation rather than true insecurity (Van Ijzendoorn and Sagi, 1999, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

A research study of development among Indigenous children in Canada, conducted by Findlay, Kohen and Miller (2014), concluded that the age range for the development of certain skills, including social skills, can be different for Indigenous children compared to the general population. For example, the cultural norm in some Indigenous identity groups of living with extended family members may influence the development of certain social skills by providing additional support and modelling behaviour. The study also found variations between Indigenous identity groups (Metis, Inuit and off-reserve First Nations) in expectations for children to develop independent behaviours. The researchers emphasized the importance of using culturally specific age ranges and interventions because using those based on the general population might result in over or under identification of children at risk for developmental delays.  (Findlay, Kohen, & Miller,  2014).

## Summary

In this chapter we looked at:

- The social developmental continuum for infants and toddlers

- Cultural variations

- Theories and styles of attachment

- Erikson's stage of trust versus distrust

- Importance of attachment and things that can impede it

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## CHAPTER 7

# *Emotional Development in Infancy and Toddlerhood*

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**Chapter Objectives**

After this chapter, you should be able to:

- Describe the continuum of development of emotional skills in infants and toddlers.
- Classify types of temperament and explain the concept of "goodness of fit".
- Explain the difference between temperament and personality.
- Discuss the roles of culture and gender in emotional development.

</div>

## INTRODUCTION

During the first three years of life, children are developing the ability to express and regulate their emotions. They are in the process of developing a sense of self. The ability to see things from another's perspective (empathy) is beginning to emerge. Let's look at this continuum of development in more detail.

## CONTINUUM OF DEVELOPMENT

The Continuum of Development set out in *Early Learning for Every Child Today: A framework for Ontario early childhood settings* (2007) identifies several root emotional skills that are emerging in children from birth to approximately 3 years of age (Ontario MInistry of Education, 2014).

   Infants (birth to 24 months of age) can express a wide range of basic emotions including: discomfort, pleasure, anger, fear, sadness and excitement. As we learned in Chapter 6, infants are developing attachments to primary caregivers and may show some anxiety when separated from the important adults in their lives. Infants have strategies to comfort themselves (e.g. thumb sucking) which helps them recover from stressful situations. Infants are beginning to develop a sense of self as they become more aware of their ability to make things happen. Older infants will notice when someone else appears upset and may offer some sort of comfort.

   Toddlers start to experience and express more complex, self-conscious emotions such as shame, guilt and pride. While infants use physical strategies for self-soothing, toddlers are starting to use language to help regulate their emotions. They are also beginning to regulate their behaviour by following verbal cues from others. Toddlers still find it challenging to pay attention without being easily distracted. Awareness of how someone else might be feeling is improving. Toddlers have a strong sense of self and need for autonomy, often manifested with a strong "No" when asked to do something.

## INFANT TODDLER EMOTIONS

At birth, infants exhibit two emotional responses: attraction and withdrawal. They show attraction to pleasant situations that bring comfort, stimulation, and pleasure, and they withdraw from unpleasant stimulation such as bitter flavours or physical discomfort. At around two months, infants exhibit social engagement in the form of social smiling as they respond with smiles to those who engage their positive attention (Lavelli & Fogel, 2005, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

Social smiling becomes more stable and organized as infants learn to use their smiles to engage their parents in interactions. Pleasure is expressed as laughter at 3 to 5 months of age, and displeasure becomes more specific as fear, sadness, or anger between ages 6 and 8 months.

Anger is often the reaction to being prevented from obtaining a goal, such as a toy being removed (Braungart-Rieker, Hill-Soderlund, & Karrass, 2010, as cited by Paris, Ricardo, Raymond, & Johnson). In contrast, sadness is typically the response when infants are deprived of a caregiver (Papousek, 2007). Fear is often associated with the presence of a stranger, known as **stranger wariness**, or the departure of significant others known as **separation anxiety**. Both appear sometime between 6 and 15 months after object permanence has been acquired. Further, there is some indication that infants may experience jealousy as young as 6 months of age (Hart & Carrington, 2002, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).



Figure 7.1: A toddler making an angry facial expression. (Photo by Alexander Dummer on Unsplash)

Emotions are often divided into two general categories: **Basic emotions** (primary emotions), such as interest, happiness, anger, fear, surprise, sadness and disgust, which appear first and **self-conscious emotions** (secondary emotions), such as envy, pride, shame, guilt, doubt, and embarrassment. Unlike primary emotions, secondary emotions appear as children start to develop a self-concept and require social instruction on when to feel such emotions. The situations in which children learn self-conscious emotions varies from culture to culture. Individualistic cultures teach us to feel pride in personal accomplishment, while in more collective cultures children are taught to not call attention to themselves, unless you wish to feel embarrassed for doing so (Akimoto & Sanbinmatsu, 1999, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

Figure 7.2: A sad looking child seeking comfort from an adult. (Photo by Jordan Whitt on Unsplash)

Facial expressions of emotion are important regulators of social interaction. In the developmental literature, this concept has been investigated under the concept of **social referencing**; that is, the process whereby infants seek out information from others to clarify a situation and then use that information to act (Klinnert, Campos, & Sorce, 1993, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). To date, the strongest demonstration of social referencing comes from work on the visual cliff. In the first study to investigate this concept, Capos and colleagues (Sorce, Emde, Campos, & Klinnert, 1985, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) placed mothers on the far end of the "cliff" from the infant. Mothers first smiled to the infants and placed a toy on top of the safety glass to attract them; infants invariably began crawling to their mothers. When the infants were in the centre of the table, however, the mother then posed an expression of fear, sadness, anger, interest, or joy. The results were clearly different for the different faces; no infant crossed the table when the mother showed fear; only 6% did when the mother posed anger, 33% crossed when the mother posed sadness, and approximately 75% of the infants crossed when the mother posed joy or interest.

Other studies provide similar support for facial expressions as regulators of social interaction. Researchers posed facial expressions of neutral, anger, or disgust toward babies as they moved toward an object and measured the amount of inhibition the babies showed in touching the object (Bradshaw, 1986, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). The results for 10- and 15-month olds were the same: Anger produced the greatest inhibition, followed by disgust, with neutral the least. This study was later replicated using joy and disgust expression, altering the method so that the infants were not allowed to touch the toy (compared with a distractor object) until one hour after exposure to the expression (Hertenstein & Campos, 2004, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). At 14 months of age, significantly more infants touched the toy when they saw joyful expressions, but fewer touched the toy when the infants saw disgust.

A significant emotional change is in self-regulation. **Emotional self-regulation** refers to strategies we use to control our emotional states so that we can attain goals (Thompson & Goodvin, 2007, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). This requires effortful control of emotions and initially requires assistance from caregivers (Rothbart, Posner, & Kieras, 2006, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Young infants have very limited capacity to adjust their emotional states and depend on their caregivers to help soothe them. Caregivers can offer distractions to redirect the infant's attention and comfort to reduce the emotional distress. As areas of the infant's prefrontal cortex continue to develop, infants can tolerate more stimulation. By 4 to 6 months, babies can begin to shift their attention away from upsetting stimuli (Rothbart et al, 2006). Older infants and toddlers can more effectively communicate their need for help and can crawl or walk toward or away from various

situations (Cole, Armstrong, & Pemberton, 2010, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). This aids in their ability to self-regulate. Temperament also plays a role in children's ability to control their emotional states, and individual differences have been noted in the emotional self-regulation of infants and toddlers (Rothbart & Bates, 2006, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

Canadian researcher Dr. Stuart Shanker has written extensively about the young child's emerging ability to **self-regulate**. He defines self-regulation as "how efficiently and effectively a child deals with a stressor and then recovers" (Shanker, 2013). We start laying the foundation for development of this skill when we use calming strategies with a newborn baby. As the prefrontal cortex grows, the **social engagement** between adult and child becomes more complex. Toddlers begin to develop the language skills (expressive and receptive) needed for self-regulation. Shanker believes that, instead of rewarding or punishing children in order to get them to do what we want, we must help with the development of self-regulation skills by:

1. identifying the underlying stressor or stressors,

2. reducing those stressors, and

3. teaching children strategies for calming themselves.

Rewards and punishment may temporarily result in a change in a child's behaviour, but they have little long-term effect because they do not address why the child is displaying the undesired behaviour (Shanker, 2013).

**Development of sense of self**: During the second year of life, children begin to recognize themselves as they gain a sense of self as separate from their primary caregiver. In a classic experiment by Lewis and Brooks (1978) children 9 to 24 months of age were placed in front of a mirror after a spot of rouge was placed on their nose as their mothers pretended to wipe something off the child's face. If the child reacted by touching their own nose rather than that of the 'baby "in the mirror, it was taken to suggest that the child recognized the reflection as themself. Lewis and Brooks found that somewhere between 15 and 24 months most infants developed a sense of self-awareness. **Self-awareness** is the realization that you are separate from others (Kopp, 2011, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Once a child has achieved self-awareness, the child is moving toward understanding social emotions such as guilt, shame or embarrassment, as well as sympathy or empathy (Lally & Valentine-French, 2019).

## TEMPERAMENT

Perhaps you have spent time with a number of infants. How were they alike? How did they differ? How do you compare with your siblings or other children you have known well? You may have noticed that some seemed to be in a better mood than others and that some were more sensitive to noise or more easily distracted than others. These differences may be attributed to temperament. Temperament is the innate characteristics of the infant, including mood, activity level, and emotional reactivity, noticeable soon after birth.

In a 1956 landmark study, Chess and Thomas (1996, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) evaluated 141 children's temperament based on parental interviews. In what is referred to as the New York Longitudinal Study, infants were assessed on 10 dimensions of temperament including:
Activity level

- Rhythmicity (regularity of biological functions)

- Approach/withdrawal (how children deal with new things)

- Adaptability to situations

- Intensity of reactions

- Threshold of responsiveness (how intense a stimulus has to be for the child to react)

- Quality of mood

- Distractibility

- Attention span

- Persistence

Based on the infants' behavioral profiles, they were categorized into three general types of temperament:

| Type | Percentage | Description |
|---|---|---|
| **Easy** | 40% | • Able to quickly adapt to routine and new situations<br>• Remains calm<br>• Easy to soothe<br>• Usually in positive mood |
| **Difficult** | 10% | • Reacts negatively to new situations<br>• Has trouble adapting to routine<br>• Usually negative in mood<br>• Cries frequently |
| **Slow-to-warm-up** | 15% | • Low activity level<br>• Adjusts slowly to new situations<br>• Often negative in mood |

Table 7.1 Types of Temperament (Paris, Ricardo, Raymond, & Johnson, 2021)

## Goodness of Fit

The term 'goodness of fit" is used to describe the degree to which a child's characteristics match the demands of their environment and the people in it.  For example, if a very active toddler lives in a small apartment, the restricted environment is at odds with the child's high need for physical activity. An example of a mismatch between a child's characteristics and a parents' would be a very calm parent who has a child who experiences emotions intensely.  A mismatch between a child's characteristics, the environment and/or the child's primary caregivers can create stress and conflict for both the child and the caregivers. Responsive caregivers who accurately read the child will enjoy a **goodness-of-fit**, meaning their styles match and communication and interaction can flow.

A good match is more likely to result in the child being successful. Success contributes to the development of healthy self-esteem.

A characteristic displayed by a child, in and of itself, is not good or bad. It is the interaction between the

characteristic and the child's environment that is critical to the child's emotional development. Caring and responsive adults respect the child's characteristics and assess themselves and the child's environment to determine what could be changed to ensure a better match.

As can be seen in Table 7.1, the percentages of types of temperament do not equal 100% as some children were not able to be placed neatly into one of the categories. Think about how each type of child should be approached to improve interactions with them. An easy child requires less intervention, but still has needs that must not be overlooked. A slow-to-warm-up child may need to be given advance warning if new people or situations are going to be introduced. A child with a difficult temperament may need to be given extra time to burn off their energy. Caregivers who recognize each child's temperament and accept it, will nurture more effective interactions with the child and encourage more adaptive functioning (Lally & Valentine-French, 2019).



Figure 7.3: Goodness of Fit: Parent matches child's adventurous activity level of their temperament. (Photo by James Wheeler on Unsplash)

## Parenting is Bidirectional

Not only do parents affect their children, children influence their parents. A child's characteristics, such as temperament, affect parenting behaviours and roles. For example, an infant with an easy temperament may enable parents to feel more effective, as they are easily able to soothe the child and elicit smiling and cooing. On the other hand, a cranky or fussy infant elicits fewer positive reactions from their parents and may result in parents feeling less effective in the parenting role (Eisenberg et al., 2008, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Over time, parents of more difficult children may become more punitive and less patient with their children (Clark, Kochanska, & Ready, 2000; Eisenberg et al., 1999; Kiff, Lengua, & Zalewski, 2011, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Parents who have a fussy, difficult child are less satisfied with their

marriages and have greater challenges in balancing work and family roles (Hyde, Else-Quest, & Goldsmith, 2004, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Thus, child temperament is one of the child characteristics that influence how parents behave with their children.

## PERSONALITY

Temperament does not change dramatically as we grow up, but we may learn how to work around and manage our temperamental qualities. Temperament may be one of the things about us that stays the same throughout development. In contrast, **personality**, defined as an individual's consistent pattern of feeling, thinking, and behaving, is the result of the continuous interplay between biological disposition and experience.

Personality also develops from temperament in other ways (Thompson, Winer, & Goodvin, 2010, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). As children mature biologically, temperamental characteristics emerge and change over time. A newborn is not capable of much self-control, but as brain-based capacities for self-control advance, temperamental changes in self-regulation become more apparent. For example, a newborn who cries frequently doesn't necessarily have a grumpy personality; over time, with sufficient parental support and increased sense of security, the child might be less likely to cry.

In addition, personality is made up of many other features besides temperament. Children's developing self-concept, their motivations to achieve or to socialize, their values and goals, their coping styles, their sense of responsibility and conscientiousness, as well as many other qualities are encompassed into personality. These qualities are influenced by biological dispositions, but even more by the child's experiences with others, particularly in close relationships, that guide the growth of individual characteristics. Indeed, personality development begins with the biological foundations of temperament but becomes increasingly elaborated, extended, and refined over time. The newborn that parents gazed upon thus becomes an adult with a personality of depth and nuance (Lally & Valentine-French, 2019).

## CULTURAL AND GENDER VARIATIONS

Within a culture there are norms and behavioural expectations. These cultural norms can dictate which personality traits are considered important. The researcher Gordon Allport considered culture to be an important influence on traits and defined common traits as those that are recognized within a culture. These traits may vary from culture to culture based on differing values, needs, and beliefs. Positive and negative traits can be determined by cultural expectations: what is considered a positive trait in one culture may be considered negative in another, thus resulting in different expressions of personality across cultures.

Figure 7.4: A family from a non-Western culture. (Photo by Ivan Andriavani on Unsplash)

Considering cultural influences on personality is important because Western ideas and theories are not necessarily applicable to other cultures (Benet-Martinez & Oishi, 2008, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). There is a great deal of evidence that the strength of personality traits varies across cultures, and this is especially true when comparing individualist cultures (such as European, North American, and Australian cultures) and collectivist cultures (such as **Indigenous**, French, Asian, African, and South American cultures). People who live in **individualist cultures** tend to believe that independence, competition, and personal achievement are important. In contrast, people who live in **collectivist cultures** tend to value social harmony, respectfulness, and group needs over individual needs. These values influence personality in different but substantial ways; for example, Yang (2006, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) found that people in individualistic cultures displayed more personally-oriented personality traits, whereas people in collectivist cultures displayed more social-oriented personality traits (Lally & Valentine-French, 2019).

In much the same manner that cultural norms can influence personality and behavior, gender norms (the behaviours that males and females are expected to conform to in a given society) can also influence personality by emphasizing different traits between different genders.

Ideas of appropriate behaviour for each gender (masculine and feminine) vary among cultures and tend to change over time. For example, aggression and assertiveness have historically been emphasized as positive masculine personality traits in Western cultures. Meanwhile, submissiveness and caretaking have historically been held as ideal feminine traits. While many **gender roles** remain the same, others change over time. In 1938, for example, only 1 out of 5 Americans agreed that a married woman should earn money in industry or business. By 1996, however, 4 out of 5 Americans approved of women working in these fields. This type of attitude change has been accompanied by behaviour shifts that coincide with changes in trait expectations and shifts in personal identity for men and women (Lally & Valentine-French, 2019).

Figure 7.4: Toddlers dressed in stereotypically Western feminine clothing. (Photo by Jelleke Vanooteghem on Unsplash)



Figure 7.5: A male toddler wearing stereotypically Western masculine clothing. (Photo by Sharon McCutcheon on Unsplash)

## Summary

In this chapter we looked at:

- The emotional developmental continuum for infants and toddlers
- The development of emotions
- Temperament and "goodness of fit"
- Personality
- Cultural and gender variations

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**CHAPTER 8**

## *Communication, Language and Literacy Development in Infancy and Toddlerhood*

**Chapter Objectives**

After this chapter, you should be able to:

- Discuss the progression of language development during the first two years
- Compare the theories of language development

### INTRODUCTION

We are social creatures. Over millennia and across cultures humans have formed relationships and organized themselves in pair bonds, family units, communities, and societies. Humans have developed ways to express spirituality, govern themselves, trade with others, keep records, and define themselves through art and stories just to name but a few human pursuits. Undoubtedly, language has played a significant role in these tasks. Indeed, from the beginning humans have created ways to communicate with others and in most societies around the globe we find humans using recognized languages to communicate with one another. In Canada there are many complexities surrounding language. Canada is viewed internationally as a bilingual nation, but only English and French are considered in this definition (Galante, 2021). These languages form a Eurocentric narrative (Khawaja, 2021), which has resulted in language discrimination and marginalization of Indigenous people and their cultures.

In fact, Canada is a multilingual society and always has been. In precolonial times, Indigenous languages thrived across the continent. Then European colonists brought with them two distinct cultures and languages, English and French and used policies and violent practices to eradicate Indigenous culture, including language. Residential Schools were established in which students were forbidden to speak their own language resulting in the eradication of many Indigenous languages.

Today there are seventy Indigenous languages spoken in Canada however, these languages remain at risk: statistics show that of these seventy languages, forty of them have fewer than five hundred fluent speakers remaining. Many of these speakers are over the age of sixty-five which means that with their passing, the risk of

extinction becomes greater (Khawaja, 2021). As a result of the Truth and Reconciliation Commission's 94 Calls to Action, many school boards across Canada are offering Indigenous languages immersion programs. (Indigenous Corporate Training Inc, 2021).

On June 21, 2019, the Indigenous Languages Act received Royal Assent. This Act, based on direction from First Nations, advocates for "legislation to establish long-term, sustainable, consistent, appropriate approaches to support First Nations in their efforts to recover, reclaim, maintain and normalize First Nations languages" (Assembly of First Nations, Languages and Culture, n.d.).

Recognizing the unique needs and values of the Indigenous peoples, and in keeping in alignment with its commitment to quality and Truth and Reconciliation, the Federal Government created the Indigenous Early Learning Framework. Developed collaboratively with Indigenous partners, the framework "sets the stage for Indigenous governance of improved and new systems of ELCC policy, programs and supports for Indigenous children and families, now and in the future" (Government of Canada, 2018). The Vision states, "This Framework envisions First Nations, Inuit and Métis children and families as happy and safe, imbued with a strong cultural identity. It sees children and families supported by a comprehensive and coordinated system of ELCC policies, programs and services that are led by Indigenous peoples, rooted in Indigenous knowledges, cultures and languages, and supported by strong partnerships of holistic, accessible and flexible programming that is inclusive of the needs and aspirations of Indigenous children and families" (Government of Canada, 2018).

**Indigenous Perspectives**

Indigenous languages have spiritual values. The language is sacred. That is why the chiefs and elders say that we need to teach our children the language.

There is mounting evidence that even though the language is not spoken in the home, Indigenous people's DNA carries the memory (kind of the same as blood memory) of "the language"; therefore, Indigenous children should be taught through bilingual literacy programs. Language may be latent. Also, in some situations, children will either go live with their grandparents (who are fluent in the language) or the grandparents live with the parents. This will expose the child to the language. See the following resource for more information  resource: **Fostering Literacy Success for First Nations, Métis and Inuit Students**

THE TWO OFFICIAL LANGUAGES AND BEYOND

In some provinces French Immersion is offered whereby English-speaking students can enroll in the French Immersion program and remain in the program through to graduation from high school.  This supports students to engage in both English and French cultures  but again  this option reflects  the colonial and  Eurocentric narrative (Khawaja, 2021).

Through immigration policies and humanitarian efforts, Canada welcomes hundreds of new Canadians to its shores each year. Many communities have organizations whose mandate is to facilitate the adjustment to living in in Canada including language classes. Ministries of Education across Canada have developed resources to support English Language Learners (ELL) and some employ teachers with specialized qualification for supporting this unique population of students.

Overall, our world is becoming increasingly multilingual. In Canada, there are 60 Indigenous languages, and 140 immigrant languages present in Canada. In

2020, Statistics Canada reported a 13.3% increase in the number of residents speaking more than one language at home (Statistics Canada, 2020). Children raised in these homes grow up exposed to and learning more than one language. According to Lowry (n.d.), 31% of people living in Toronto speak a language other than English at home.

## LEARNING TWO OR MORE LANGUAGES AT ONCE

Lowry (n.d.), in association with the Hanen Centre in Toronto describes the ways in which children become bilingual or multilingual.

**Simultaneous Acquisition** refers to a child being raised bilingually from birth, or when the second language is introduced before the age of three. Children learning to speak two languages simultaneously move through the same developmental stages of language acquisition as children only learning one language to acquire two separate languages. From an early age they are able to differentiate between the two languages and switch languages depending on the context and to whom they are speaking and conversing with (Lowry, n.d.).

**Sequential Acquisition** refers to the learning of a second language after the first language is well-established. This would generally be after three years of age. This often occurs when a child immigrates to a country where the first language is not spoken or when they begin school where instruction is offered in a language other than the language spoken at home (Lowry, n.d.).

There are myths around children learning two languages at once. For example, concerns about language delays, and confusion between languages. The Hanen Centre research-based information that dispels these myths and offers many resources to support language development for all children (Lowry, n.d.)

## MOVING FORWARD

To better describe human's experience with languages, some, for example, Dr. Angelica Galante, proposes that we be begin thinking in terms of pluricultural and plurilingual (Galante, 2020).

Do newborns communicate? Absolutely! However, they do not communicate with the use of verbal language as words. Instead, they communicate their thoughts and needs with body posture (being relaxed or still), gestures, cries, and facial expressions. A person who spends adequate time with an infant can learn which cries indicate pain and which ones indicate hunger, discomfort, or frustration as well as translate their vocalizations, movements, gestures and facial expressions.

Indeed, a significant component of human communication takes place through channels of non-verbal communication. To be a socially competent person and have positive relationships with others, children need to understand nonverbal communication and how to use it effectively.

In the first few weeks and months infants' communication tends to be related to their physiological needs. 'I am hungry'. 'I am in pain'. 'I am cold'. In the second half of the first-year infants begin to communicate psychological needs as well. 'I am bored'. 'I am frightened'. 'I am excited to see you' (Kail & Zoner, 2017).

Figure 8.1: An infant looking up at the camera. (Image by Andres and Antoinette Ricardo used with permission)

**Indigenous Perspectives**

Within families that are traditional, more and more infants/newborns are exposed to the language through song and ceremonies.

## STAGES OF LANGUAGE DEVELOPMENT

In order to learn a language, it is necessary to be able to distinguish the basic speech sounds of that language. These sounds are referred to as phonemes and are considered the basic building blocks that are joined to create words. Phonemes include both consonant sounds and vowel sounds. For example, the sound of 'm' in mat and the sound of 'e' in leg. Children as young as one month of age can distinguish many of these sounds. (Aslin, Jusczyk, Pisoni, 1998). Towards their first birthday infants are primarily 'tuned in' to the sounds of the language they are exposed to daily, and they begin to understand the recurring patterns in the sounds they are hearing. These patterns include actual words and linguistic stress helps them to determine the beginning and end of words. In English one syllable words, of which there are many, are stressed. In most two syllabled words, typically the first syllable is stressed followed by an unstressed syllable. Research shows that infants pay more attention to stressed syllables than unstressed syllables. This is an effective strategy for identifying and learning words (Aslin et al, 1998). Indeed, by six months of age, infants are able to look to the correct parent when they hear the word "mommy" or "daddy" (Tincoff & Jusczyk, 1999).

Of course, it takes time and practice to move from recognizing sounds and the patterns of sounds to be able to understand and speak a language. In this chapter you will learn about theories of language development and strategies that caregivers can use to support this development.

**Intentional Vocalizations:** Cooing and taking turns: Infants begin to vocalize and repeat vocalizations within the first couple of months of life. That gurgling, musical vocalization called cooing can serve as a source of entertainment to an infant who has been laid down for a nap or seated in a carrier on a car ride. Cooing serves as practice for vocalization as well as the infant hears the sound of their own voice and tries to repeat sounds that are entertaining. Infants also begin to learn the pace and pause of conversation as they alternate their vocalization with that of someone else and then take their turn again when the

other person's vocalization has stopped. Cooing initially involves making vowel sounds like "oooo". Later, consonants are added to vocalizations such as "nananananana".

**Babbling and gesturing:** At about four to six months of age, infants begin making even more elaborate vocalizations that include the sounds required for any language. Guttural sounds, clicks, consonants, and vowel sounds stand ready to equip the child with the ability to repeat whatever sounds are characteristic of the language heard. Eventually, these sounds will no longer be used as the infant grows more accustomed to a particular language. Babies who are deaf also use gestures to communicate wants, reactions, and feelings. Because gesturing seems to be easier than vocalization for some toddlers, sign language is sometimes taught to enhance one's ability to communicate by making use of the ease of gesturing. The rhythm and pattern of language is used when babies who are deaf sign just as it is when hearing babies babble.

**Understanding:** At around ten months of age, the infant can understand more than they can say. You may have experienced this phenomenon as well if you have ever tried to learn a second language. You may have been able to follow a conversation more easily than to contribute to it.

**Fast mapping:** refers to children connecting words to the thing the word or phrase stands for. Children do this rapidly without considering all possible meanings of the word.

Learning theorists would emphasize that imitation is required in language acquisition and that children simply acquire language by copying what they hear. If this were true, how can we explain why young children say, 'I goed to the zoo.' or 'I runned along the road.' or 'It's mine turn!' when they do not hear adults saying these things?

More modern theories view language from a cognitive perspective and describe language acquisition as the mastering of many skills.

Here are some examples of rules children use in acquiring language.

- the new word refers to the object that does not already have a name and

- the word refers to the whole object.

- if an object has a name and another name is introduced, it must be a sub category.

- a word applied consistently to one of a group must be a proper noun or the name for one of them

Sentences spoken by others provide cues that help with meaning and vocabulary.
Some errors which children make are:

- underextension (car only means the family car)

-  overextension (touque refers to all hats and head gear)

These errors disappear as children refine meanings and receive feedback from caregivers.

Now we are going to focus on two distinct styles of language: referential and expressive styles.

**Referential style** refers to the use of labels for objects. Children who use this style of language tend to use it  as an intellectual tool to learn and talk about objects (similar to the genre of non- fiction).

 **Expressive style** refers to the use of social phrases. Children who use this style of language tend to use it as a social tool to enhance interactions with others (similar to the genre of fiction). In communicating with others, both styles are important and most children use a blend of the two styles.

## COMMUNICATION WITH OTHERS

At around ten months of age children begin to deliberately communicate with others. This might begin with gestures such as pointing or touching an object (Bates, Benigni, Bretherton, Camaioni, Volterra, 1979). Joint attention is a term that is used to describe the approach caregivers take when they carefully watch what interests the child and respond to them. This might mean looking towards an object the child is pointing to and labeling it. 'Yes, there is a truck going by. It is big and loud, isn't it!' This practice supports the bundling of vocabulary as the child learns the labels for the world around them.

Many families encourage turn taking, which is an essential component of an effective conversation, before the infant uses actual words. This involves initiating interaction or responding to child's interest. Another strategy families use is modelling the turn taking aspect of conversation by demonstrating how the role of speaker and listener alternate (Shatz, 1983).

**Example: Father and Cameron, a toddler, going for a walk.**

It is a cold winter's day. As they leave their home, Cameron spots a neighbour walking with their dog. Cameron points to the dog and looks up at the father.

'Puppy walk?'

'Yes', says the father, 'Shadow's going for a walk like us. He's wearing a coat just like we are.'

'Coat?'

'Yes, can you see it? It keeps his body warm on a cold day'

'My coat?' Cameron looks down and with both hands pulls the bottom of his coat out to take a better look at it. Cameron looks towards the dog and then back up at his father. 'Puppy wear mittens?'

'No, his father replies, 'I do not think Shadow has mittens, but sometimes when it is very cold dogs wear boots on their feet.'

'My boots' Cameron says proudly and stomps both his feet in the snow and looks up at his father and smiles.

The Hanen Centre in Toronto describes how these back-and-forth approaches have a significant impact on brain development related to language production and processing. It is these interactions rather than just hearing words that provide powerful opportunities for learning (Weitzman, 2017). By their first birthday children will use speech rather than relying on gestures, to initiate a conversation with others (Bloom, Margulis, Tinker & Fujita, 1996). By the time children are two years of age, turn-taking is common in conversations between the child and their caregivers (Barton & Tomasello, 1991). These early conversations are typically about significant people in their lives, and other things that are important to them such as pets, toys and favourite foods.

**Holophrastic speech:** Children begin using their first words at about 12 or 13 months of age and may use partial words to convey thoughts at even younger ages. These one-word expressions are referred to as holophrastic

speech. For example, the child may say "ju" for the word "juice" and use this sound when referring to a bottle. The listener must interpret the meaning of the holophrase and when this is someone who has spent time with the child, interpretation is not too difficult. They know that "ju" means "juice" which means the baby wants some milk! But someone who has not been around the child will have trouble knowing what is meant. Imagine the parent who to a friend exclaims, "Ezra's talking all the time now!" The friend hears only "ju da ga" which, the parent explains, means "I want some milk when I go with Daddy."



Figure 8.22: Two children playing with toys. (Image by the U.S. Air Force is in the public domain)

**Underextension:** A child who learns that a word stands for an object may initially think that the word can be used for only that particular object. Only the family's Irish Setter is a "doggie". This is referred to as underextension.

**Overextension:** More often, however, a child may think that a label applies to all objects that are similar to the original object. In overextension all animals become "doggies", for example.

**First words and cultural influences:** First words if the child is using English tend to be nouns. The child labels objects such as cup or ball. In a verb-friendly language such as Chinese, however, children may learn more verbs. This may also be due to the different emphasis given to objects based on culture. Chinese children may be taught to notice action and relationship between objects while children from the United States may be taught to name an object and its qualities (color, texture, size, etc.). These differences can be seen when comparing interpretations of art by older students from China and the United States.

**Vocabulary growth spurt:** One-year olds typically have a vocabulary of about 50 words. But by the time they become toddlers, they have a vocabulary of about 200 words and begin putting those words together in telegraphic speech (I think of it now as 'text message' speech because texting is more common and is similar in that text messages typically only include the minimal number of words to convey the message).

**Two-word sentences and telegraphic speech:** Words are soon combined and 18-month-old toddlers can express themselves further by using expressions such as "baby bye- bye" or "doggie pretty". Words needed to convey messages are used, but the articles and other parts of speech necessary for grammatical correctness are not yet used. These expressions sound like a telegraph (or perhaps a better analogy today would be that they read like a text message) where unnecessary words are not used. "Give baby ball" is used rather than "Give the baby the ball." Or a text message of "Send money now!" rather than "Dear Mother. I really need some money to take care of my expenses" (Leon, n.d.).

Figure 8.3:  A toddler playing with a toy telephone. (Image by Salim Virji is licensed under CC BY-SA 2.0)

The Continuum of Development describes (Ontario Ministry of Education, 2014) communication, language and literacy skills for infants and toddlers. Skills developed during this time include such things as referencing, joint attention, gestures, turning taking, expressive and receptive language skills. These early skills support the development of such skills as having a conversation.

## LANGUAGE MILESTONES

In the first two years of life, children go from communicating by crying to being able to express themselves with words. Here is a table of common language milestones for infants and toddlers.

| Typical Age | Typical Skill |
|---|---|
| 2 months | • Coos, makes gurgling sounds<br>• Turns head toward sounds |
| 4 months | • Begins to babble<br>• Babbles with expression and copies sounds he hears<br>• Cries in different ways to show hunger, pain, or being tired |
| 6 months | • Responds to sounds by making sounds<br>• Strings vowels together when babbling ("ah," "eh," "oh") and likes taking turns with parent while making sounds<br>• Responds to own name<br>• Makes sounds to show joy and displeasure<br>• Begins to say consonant sounds (jabbering with "m," "b") |
| 9 months | • Understands "no"<br>• Makes a lot of different sounds like "mamamama" and "babababababa"<br>• Copies sounds and gestures of others<br>• Uses fingers to point at things |
| 1 years | • Responds to simple spoken requests<br>• Uses simple gestures, like shaking head "no" or waving "bye-bye"<br>• Makes sounds with changes in tone (sounds more like speech)<br>• Says "mama" and "dada" and exclamations like "uh-oh!"<br>• Tries to say words you say |
| 18 months | • Says several single words<br>• Says and shakes head now<br>• Points to show others what is wanted |
| 2 years | • Points to things or pictures when they are named<br>• Knows names of familiar people and body parts<br>• Says sentences with 2 to 4 words<br>• Follows simple instructions<br>• Repeats words overheard in conversation<br>• Points to things in a book |

Table 1: Language Milestones (Developmental Milestones by the CDC is in the public domain)

## CHILD-DIRECTED SPEECH

Why is a horse a "horsie"? Have you ever wondered why adults tend to use "baby talk" or that sing-song type of intonation and exaggeration used when talking to children? This represents a universal tendency and is known as child-directed speech or parentese (formerly referred to as motherese and now referred to as parentese). It involves exaggerating the vowel and consonant sounds, using a high-pitched voice, and delivering the phrase with

great facial expression. Why is this done? It may be in order to clearly articulate the sounds of a word so that the child can hear the sounds involved. Or it may be because when this type of speech is used, the infant pays more attention to the speaker and this sets up a pattern of interaction in which the speaker and listener are in tuned with one another (Leon, n.d.).

**Theories of Language Development**

The following two theories of language development represent two extremes in the level of interaction required for language to occur (Berk, 2007, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## Chomsky and the Language Acquisition Device

The view known as nativism advocated by Noam Chomsky suggests that infants are equipped with a neurological construct referred to as the Language Acquisition Device or LAD that makes infants ready for language. Language develops as long as the infant is exposed to it. No teaching, training, or reinforcement is required for language to develop.

## Social Pragmatics

Another view emphasizes the child's active engagement in learning language out of a need to communicate. The child seeks information, memorizes terms, imitates the speech heard from others and learnsto form concepts using words as language is acquired. Many would argue that all three of these dynamics foster the acquisition of language (Berger, 2004, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## LANGUAGE STYLES

Researchers have identified that as toddlers develop language two distinct styles can be identified. These two styles are referred to as referential and expressive styles (Bates, Bretherton & Snyder, 1988) . Most toddlers prefer one of the two styles, but some blend the two styles. Toddlers who show a preference for the referential style use language to label objects and people. They tend to use single words eventually building up to phrases. They tend to interact more with adults than peers and may build vocabulary at a fast pace (Babysparks, 2019)

Children showing a preference for the expressive style use it to express feeling, needs and to socialize with adults and peers. They tend to speak in longer phrases and are not particularly concerned about being understood. Eventually longer phrases are broken down into single words. Compared to toddlers who prefer the referential style of language, vocabulary is acquired at a slower pace (Babysparks, 2019).

As with many aspects of development, culture influences the distribution of these styles of language. Research shows that caregivers in North American tend to encourage the labelling of objects and in contrast caregivers in Japan who tend to model the use of language for social connections with others (Babysparks, 2019). To support the development of both styles of language, caregivers can use intentional strategies, which emphasize the two styles and also select quality picture books which include both referential and expressive styles of language to read to toddlers.

**Summary**

In this chapter we looked at:

- Infant and toddler communication language and how that leads to literacy development.

• The progression and theories of language development were discussed as they relate to the first 2 years of development.

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**CHAPTER 9**

## *Physical Development in the Preschool Years*

Chapter Objectives

After this chapter, you should be able to:

- Describe the physical changes that occur in early childhood.
- Explain how to provide health nutrition for 3- to 5-year-olds.
- Summarize how to support the progression of motor skills with age-appropriate activities.
- Discuss sleep needs during early childhood and sleep disorders that may affect children.
- Explain the development behind toilet training and some elimination disorders that children may experience.
- Discuss risks of and a variety of ways to promote and protect children's health and safety.

### INTRODUCTION

During the early childhood years of ages three to five we see significant changes in the way children look, think, communicate, regulate their emotions, and interact with others. Children are often referred to as preschoolers during this time period. We'll examine the physical changes of the preschooler in this chapter.

### GROWTH IN EARLY CHILDHOOD

Preschool aged children tend to grow about 3 inches in height each year and gain about 4 to 5 pounds in weight each year. A 3 year old is very similar to a toddler with a large head, large stomach, short arms and legs. But by the time the child comes out of this stage, their torso has lengthened, and their body proportions have become more like those of adults. According to WHO (2021), the average 5 year old weighs approximately 43 pounds and is about 43 inches in height. This growth rate is slower than that of infancy.

### NUTRITIONAL CONCERNS

That slower rate of growth is accompanied by a reduced appetite between the ages of 2 and 5. Children between the ages of 2 and 3 need 1,000 to 1,400 calories, while children between the ages of 4 and 8 need 1,200 to 2,000 calories (Mayo Clinic, 2016a, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). This change can sometimes be

surprising to parents and lead to the development of poor eating habits. However, by providing adequate, sound nutrition, and limiting sugary snacks and drinks, the caregiver can be assured that 1) the child will not starve; and 2) the child will receive adequate nutrition. Caregivers need to keep in mind that they are setting up taste preferences at this age. Young children who grow accustomed to high fat, very sweet and salty flavours may have trouble eating foods that have more subtle flavours such as fruits and vegetables. Consider the following advice about establishing eating patterns for years to come (Rice, 1997, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Notice that keeping mealtime pleasant, providing sound nutrition and not engaging in power struggles over food are the main goals (Leon, n.d.).

## TIPS FOR ESTABLISHING HEALTHY EATING HABITS

1. Don't try to force your child to eat or fight over food. Of course, it is impossible to force someone to eat. But the real advice here is to avoid turning food into a power struggle so that food doesn't become a way to gain favour with or express anger toward someone else.

2. Recognize that appetite varies. Children may eat well at one meal and have no appetite at another. Rather than seeing this as a problem, it may help to realize that appetites do vary. Continue to provide good nutrition at each mealtime (even if children don't choose to eat the occasional meal).

3. Keep it pleasant. This tip is designed to help caregivers create a positive atmosphere during mealtime. Mealtimes should not be the time for arguments or expressing tensions. You do not want the child to have painful memories of mealtimes together or have nervous stomachs and problems eating and digesting food due to stress.

4. No short order chefs. While it is fine to prepare foods that children enjoy, preparing a different meal for each child or family member sets up an unrealistic expectation from others. Children probably do best when they are hungry and a meal is ready. Limiting snacks rather than allowing children to "graze" continuously can help create an appetite for whatever is being served.

5. Limit choices. If you give your preschool aged child choices, make sure that you give them one or two specific choices rather than asking "What would you like for lunch?" If given an open choice, children may change their minds or choose whatever their sibling does not choose!

6. Serve balanced meals. Meals prepared at home tend to have better nutritional value than fast food or frozen dinners. Prepared foods tend to be higher in fat and sugar content as these ingredients enhance taste and profit margin because fresh food is often more costly and less profitable. However, preparing fresh food at home is not costly. It does, however, require more activity. Including children in meal preparation can provide a fun and memorable experience.

7. Don't bribe. Bribing a child to eat vegetables by promising dessert is not a good idea. First, the child will likely find a way to get the dessert without eating the vegetables (by whining or fidgeting, perhaps, until the caregiver gives in). Secondly, it teaches the child that some foods are better than others. Children tend to naturally enjoy a variety of foods until they are taught that some are considered less desirable than others. A child, for example, may learn the broccoli they have enjoyed is seen as yucky by others unless it's smothered in cheese sauce! (Leon, n.d.).

Figure 9.1:Two children cooking together. (Image by the Air Force Medical Service is in the public domain)

## MEAL RECOMMENDATIONS FOR PRESCHOOL AGED CHILDREN

The Dieticians of Canada recommend that preschool aged children should be offered the same foods that the rest of the family eats. It is recommended that families/caregivers offer foods with different tastes, textures and colours according to Canada's Food Guide (Dieticians of Canada, 2020)

**Table 9.1: Sample Menu 1 for Preschoolers: 3 to 5 years old**

| Sample Menu 1 | |
| --- | --- |
| Breakfast | Mini mushroom omelettes or breakfast cups<br>Strawberries and banana slices<br>   Milk |
| Morning Snack | Quark and berries parfait<br>Water |
| Lunch | Cream of parsnip and carrot soup<br>100% whole wheat unsalted crackers or pita bread<br>   Raw vegetables (carrots, celery sticks, red pepper slides) with salad dressing for dipping<br>   Milk |
| Afternoon Snack | Apple slices with nut butter or cheddar cheese<br>Water |
| Dinner | Mini meatballs<br>Whole wheat pasta with tomato and vegetable pasta sauce<br>   Milk |
| Bedtime Snack | Granola and fruit bites |

(Dieticians of Canada, 2020)

**Table 9.2: Sample Menu 2 for Preschoolers: 3 to 5 years old**

**Sample Menu 2**

| | |
|---|---|
| Breakfast | Oatmeal pancakes with apple sauce<br>Milk |
| Morning Snack | Yogurt and fruit smoothie |
| Lunch | Tuna grilled cheese or mini sandwiches on multigrain or whole wheat crackers<br>Cucumber slices with dip<br>  Orange wedges<br>  Milk |
| Afternoon Snack | Hummus with raw vegetables (carrots, celery sticks, red pepper slices) baked tortilla chips or whole wheat pita bread<br>Water |
| Dinner | Tofu vegetable stir fry with brown rice<br>Milk |
| Bedtime Snack | Chocolate and almond bites bars |

(Dieticians of Canada, 2020)

## BRAIN MATURATION

### BRAIN WEIGHT

Brain growth slows during the preschool years. The brain is about 75% its adult weight by two years of age and by age 6, it is approximately 95% its adult weight. Myelination and the development of dendrites continues to occur in the cortex and as it does, we see a corresponding change in the child's abilities. Significant development in the prefrontal cortex (the area of the brain behind the forehead that helps us to think, strategize, and control emotion) makes it increasingly possible to control emotional outbursts and to understand how to play games. Consider 4- or 5-year-old children and how they might approach a game of soccer. Chances are, every move would be a response to the commands of a coach standing nearby calling out, "Run this way! Now, stop. Look at the ball. Kick the ball!" And when the child is not being told what to do, they are likely to be looking at the clover on the ground or a dog on the other side of the fence! Understanding the game, thinking ahead, coordinating movement, and handling losing improve with practice and myelination (Lumen Learning, n.d.).

### VISUAL PATHWAYS

Children's drawings are representative of the development of visual pathways; as children's brains mature the images in their drawings change. Early scribbles and dots illustrate the use of simple motor skills. No real connection is made between an image being visualized and what is created on paper.
At age 3, the child begins to draw wispy creatures with heads and not much other detail. Gradually pictures begin to have more detail and incorporate more parts of the body. Arm buds become arms and faces take on noses, lips and eventually eyelashes.

*Figure 9.2: Early scribbles (CC BY-SA 3.0; Image by Wikimedia)*

*Figure 9.3: Creatures with heads (CC BY 4.0; Image by torange.biz)*



Figure 9.4:  A detailed face. (CC-BY 4.0; Image by torange.biz)

## GROWTH IN THE HEMISPHERES AND CORPUS CALLOSUM

Between ages 3 and 6, the left hemisphere of the brain grows dramatically. This side of the brain or hemisphere is typically involved in language skills. The right hemisphere continues to grow throughout early childhood and is

involved in tasks that require spatial skills such as recognizing shapes and patterns. The corpus callosum which connects the two hemispheres of the brain undergoes a growth spurt between ages 3 and 6 and results in improved coordination between right and left hemisphere tasks.

## MOTOR SKILL DEVELOPMENT

Early childhood is a time when children are especially attracted to motion and song. Days are filled with jumping, running, swinging and clapping and every place becomes a playground. Even the booth at a restaurant affords the opportunity to slide around in the seat or disappear underneath and imagine being a sea creature in a cave! Of course, this can be frustrating to a caregiver, but it's the business of early childhood.

## GROSS MOTOR SKILLS

Children continue to improve their gross motor skills as they run and jump. They frequently ask their caregivers to "look at me" while they hop or roll down a hill. Children's songs are often accompanied by arm and leg movements or cues to turn around or move from left to right.

## GROSS MOTOR MILESTONES

The Continuum of Development shares that during the preschool years the development of gross motor skills focus on increasing in coordination, speed, and endurance (Ontario Ministry of Education, 2014). Specifically, the following motor movements are being refined:

- Walking: beginning to walk with opposite leg-arm swing, walking up stairs with alternating feet, walking down stairs with alternating feet;

- Jumping: jumping increases in co-ordination;

- Hopping: hopping on one foot increases;

- Galloping: galloping and one-foot skipping emerge;

- Throwing: throwing with rigid movements and throwing with increased co-ordination;

- Riding: pedalling and steering riding toys, and riding a tricycle smoothly;

- Movement and Expression: increasing control over own movements skills, becoming expressive using movement, expressing moods in movement, moving to music, matching movements to the rhyme and mood of the music, making patterns while moving to music, working together in shared dance and movement activities.

(Ontario Ministry of Education, 2014)

Indigenous Perspectives

*Connecting to mother earth through dance*
*(Montanabw, CC BY-SA 3.0)*

Indigenous children love to dance with or without their Regalia (outfits). Their spirit soars when they dance. It gives them a sense of belonging and connects them to mother earth. It also reinforces what the Continuum of Development says [the development of gross motor skills focuses on increasing coordination, speed, and endurance]. As they have been watching the adults dance, young children's dance movements really improve at this age.

## ACTIVITIES TO SUPPORT GROSS MOTOR SKILLS

Here are some activities focused on play that young children enjoy and that support their gross motor skill development.

- Tricycle

- Slides

- Swings

- Sit-n-Spin

- Mini trampoline

- Bowling pins (can use plastic soda bottles also)

- Tent (try throwing blankets over chairs and other furniture to make a fort)

- Playground ladders

- Suspension bridge on playground

- Tunnels (try throwing a bean bag chair underneath for greater challenge)

- Ball play (kick, throw, catch)

- Simon Says

- Target games with bean bags, ball, etc.

- Dancing/moving to music

- Pushing self on scooter or skateboard while on stomach



Figure 9.5: Child riding a bicycle. (Photo by Chip Vincent on Unsplash)

## FINE MOTOR SKILLS

Fine motor skills are also being refined as they continue to develop more dexterity, strength, and endurance. Fine motor skills are very important as they are foundational to self-help skills and later academic abilities (such as writing).

## FINE MOTOR MILESTONES

The Continuum of Development shares that during the preschool years the development of fine motor skills focus on the following:

- Dressing: mastering simple items of clothing; dressing without assistance.

- Eating: eating using forks and knives.

- Tool Use: stringing large beads, cutting paper with scissors, cutting a straight line.

- Drawing: copying straight lines, copying triangles and crosses.

(Ontario Ministry of Education, 2014)

## ACTIVITIES TO SUPPORT FINE MOTOR SKILLS

Here are some fun activities that will help children continue to refine their fine motor abilities. Fine motor skills are slower to develop than gross motor skills, so it is important to have age-appropriate expectations and play-based activities for children.

- Pouring water into a container

- Drawing and colouring

- Using scissors

- Finger painting

- Fingerplays and songs (such as the Itsy, Bitsy Spider)

- Play dough

- Lacing and beading

- Practicing with large tweezers, tongs, and eye droppers



Figure 9.6: Children colouring. (Image by Spangdahlem Air Base is in the public domain)

## SLEEP AND EARLY CHILDHOOD

Along with food and water, sleep is one of the human body's most important physiological needs—we cannot live without it. Extended sleeplessness (i.e., lack of sleep for longer than a few days) has severe psychological and physical effects. Research on rats has found that a week of no sleep leads to loss of immune function, and two weeks of no sleep leads to death. Recently, neuroscientists have learned that at least one vital function of sleep is related to learning and memory. New findings suggest that sleep plays a critical role in flagging and storing important memories, both intellectual and physical, and perhaps in making subtle connections that were invisible during waking hours (Leon, n.d.).

### How much sleep do we need?

The amount of sleep an individual needs varies depending on multiple factors including age, physical condition, psychological condition, and energy exertion. Just like any other human characteristic, the amount of sleep people need to function best differs among individuals, even those of the same age and gender.

Though there is no magic sleep number, there are general rules for how much sleep certain age groups need. According to The Hospital for Sick Children (SickKids) (2020) in Toronto, during the preschool years, children are sleeping approximately 10-12 hours each day, with most of the sleep occurring in one large chunk at night. This change in sleep patterns means that daytime naps will be dropped organically or weaned in order to make room for that important nighttime sleep. This may be a challenging time for children and their families as they respond to the transition. Some children may struggle to remain awake during the latter part of the day and may need extra support to regulate their behaviours and emotions during this stressful period. If the child attends a full day child care program, it is essential that the family and the educators work together to develop a sleep strategy designed in the best interest of the child.

Figure 9.7: A child sleeping. (Image by Peter Griffin is in the public domain)

## SLEEPWALKING (SOMNAMBULISM)

Sleepwalking (sometimes called sleepwalking disorder, somnambulism, or noctambulation) causes a person to get up and walk during the early hours of sleep. The person may sit up and look awake (though they're actually asleep), get up and walk around, move items, or dress or undress themselves. They will have a blank stare and still be able to perform complex tasks. Some individuals also talk while in their sleep, saying meaningless words and even having arguments with people who are not there. A person who sleepwalks will be confused upon waking up and may also experience anxiety and fatigue.

According to Healthline (2018), sleepwalking is most common in children aged 4-8. Most children who sleepwalk begin to do so an hour or two after falling asleep and episodes usually last from five to 15 minutes. This behaviour is typically harmless, and most children grow out of it. However, it can be dangerous if left unaddressed. It's important to protect your child from possible injury from sleepwalking by gently guiding them back to bed once discovered. Do not try to wake the sleepwalker, as this could aggravate them. Instead, simply reassure the child with words and help steer them back to bed.

## NIGHT TERRORS AND NIGHTMARE DISORDER

Night terrors are characterized by a sudden arousal from deep sleep with a scream or cry, accompanied by some behavioural manifestations of intense fear. They are often accompanied by sleep walking. Night terrors typically occur in the first few hours of sleep, during stage 3 NREM sleep and tend to happen during periods of arousal from delta sleep (i.e., slow-wave sleep). According to the Hospital for Sick Children (SickKids) (2011), unlike nightmares, children who have night terrors rarely wake up during the episode. They often do not have memories of the night terror. During the episode, they will show signs of fear, anxiety and general disturbance. Children are typically not fully conscious and may speak without making sense. Night terrors are common in children younger than six years old.

## TOILET TRAINING (OR TOILET LEARNING)

Learning how to use the toilet typically occurs between the ages of 2-4. Some children show interest by age 2, but others may not be ready until months later. The average age for girls to be toilet trained is 29 months and for

boys it is 31 months, and 98% of children are trained by 36 months (Boyse & Fitzgerald, 2010, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). The child's age is not as important as their physical, emotional and cognitive readiness. If started too early, it might take longer to support a child in learning how to use the toilet.

According to the Canadian Paediatric Society via Caring for Kids (2018), caregivers can assume that a child is ready for toilet learning when they:

- Show an interest in the potty (by watching you, or by liking books about learning to use the potty).

- Are dry in their diaper for several hours in a row.

- Have regular and predictable bowel movements or knows when they are urinating or having a bowel movement. For example, a child might go into another room or hide behind furniture.

- Are steady and balanced when sitting on the toilet or potty.

- Can follow one or two simple instructions.

- Can let you know when they need to use the potty.

- Want to be independent.

If a child resists being trained or it is not successful after a few weeks, it is best to take a break and try again when they show more significant interest in the process. Most children master daytime bladder control first, typically within two to three months of consistent toilet training. However, nap and nighttime training might take months or even years.



Figure 9.8: A child learning to be toilet trained. (Image by Manish Bansal is licensed under CC-BY-2.0)

## ELIMINATION DISORDERS

Some children experience elimination disorders including:

- enuresis – the repeated voiding of urine into bed or clothes (involuntary or intentional) after age 5

- encopresis – the repeated passage of feces into inappropriate places (involuntary or intentional).

The prevalence of enuresis is 5%-10% for 5 year-olds, 3%-5% for 10 year-olds and approximately 1% for those 15 years of age or older. Around 1% of 5 year-olds have encopresis, and it is more common in males than females. These are diagnosed by a medical professional and may require treatment (Lally & Valentine-French, 2019).

## HEALTH IN EARLY CHILDHOOD

### CHILDHOOD OBESITY

Childhood obesity is a complex health issue. It is diagnosed when a child is well above the normal or healthy weight for their age and height. Childhood obesity is on the rise; obesity rates among children and youth in Canada have nearly tripled in the last 30 years (Government of Canada, 2019). Where people live can affect their ability to make healthy choices. Obesity disproportionally affects children from low-income families.

### CAUSES OF OBESITY

The causes of excess weight gain in young people are similar to those in adults, including factors such as a person's behaviour and genetics. Behaviours that influence excess weight gain include:

- eating high calorie, low-nutrient foods
- not getting enough physical exercise
- sedentary activities (such as watching television or other screen devices)
- medication use
- sleep routines



Figure 9.9:A child using an electronic devise instead of playing. (Photo by zhenzhong liu on Unsplash)

### CONSEQUENCES OF OBESITY

The consequences of childhood obesity are both immediate and long-term. It can affect physical as well as social and emotional well-being.
   **More immediate Health Risks:**

- High blood pressure and high cholesterol, which are risk factors for cardiovascular disease (CVD).
- Increased risk of impaired glucose tolerance, insulin resistance, and type 2 diabetes.
- breathing challenges, such as asthma and sleep apnea.
- Joint problems and musculoskeletal discomfort.
- Fatty liver disease, gallstones, and gastro-esophageal reflux (i.e., heartburn).

**Childhood Obesity is also related to:**

- Psychological challenges, such as anxiety and depression.
- Low self-esteem and lower self-reported quality of life.
- Social problems such as bullying and stigma.

**Future Health Risks:**

- Children who have obesity are more likely to become adults with obesity. Adult obesity is associated with increased risk of a number of serious health conditions including heart disease, type 2 diabetes, and cancer.
- If children have obesity, their obesity and disease risk factors in adulthood are likely to be more severe.

To fight off the risk of obesity in preschool aged children, the Government of Canada (2019) suggests that caregivers support children in developing healthy eating habits and encourage physical activity. They suggest the following:

**Tips for developing healthy eating habits:**

- Use the Canada Food Guide to plan meals/snacks.
- Set a good example by being a role model for healthy eating. Children are more likely to try new foods if you eat them too.
- Limit distracted eating by keeping the food at the meal the focus.
- Involve children in planning and preparing meals and snacks.

**Tips for encouraging physical activity:**

- Aim for at least 180 minutes spent in a variety of physical activities spread throughout the day, including at least 60 minutes of energetic play (CSEP, 2021),
- Set a good example by being a role model for participating in consistent physical activity.
- Limit the amount of time your children spend on sedentary activities like watching television, playing video games, and surfing the web.

## FOOD ALLERGIES

According to Food Allergy Canada (2021),

- more than 3 million Canadians self-report having at least one food allergy.

- almost 500,000 Canadian children under 18 years have food allergies.

- peanut allergies in Canada affect about 2 in 100 children.

A food allergy occurs when the body has a specific and reproducible immune response to certain foods. Although the immune system normally protects people from germs, in people with food allergies, the immune system mistakenly responds to food as if it were harmful. The body's immune response can be mild, moderate, severe or life-threatening. An example of a severe or life-threatening response would be anaphylaxis. Anaphylaxis is a sudden and severe allergic reaction that may cause death.  Children at risk of anaphylaxis will likely have immediate access to an epinephrine auto-injector (e.g. EpiPen®, ALLERJECT®) which contains life-saving medication to treat an allergic reaction. Under Sabrina's Law, every school board in Ontario is required to establish and maintain an anaphylactic policy. The law also requires schools to create individual plans for each child at risk of anaphylaxis.

## Symptoms of anaphylaxis generally include two or more of these body systems.

- Skin: hives, swelling (face, lips, tongue), itching, warmth, redness

- Respiratory (breathing): coughing, wheezing, shortness of breath, chest pain/tightness, throat tightness, hoarse voice, nasal congestion or hay fever-like symptoms (runny itchy nose and watery eyes, sneezing), trouble swallowing

- Gastrointestinal (stomach): nausea, pain/cramps, vomiting, diarrhea

- Cardiovascular (heart): paler than normal skin colour/blue colour, weak pulse, passing out, dizziness or lightheadedness, shock

- Other: anxiety, sense of doom (the feeling that something bad is about to happen), headache, uterine cramps, metallic taste

(Food Allergy Canada, 2021)

Some preschool children may not have diagnosed food allergies, rather suffer from food intolerances. A food intolerance is the inability to digest or absorb certain foods. For example, someone with lactose intolerance doesn't have enough of the enzyme lactase to break down the sugar (lactose) in dairy products. The symptoms of food intolerance affect the gastrointestinal tract and can cause discomfort but are generally not life-threatening (Food Allergy Canada, 2021).

### Indigenous Perspectives

Poverty and the lack of access to healthy foods affect all remote Indigenous communities in Canada. Healthy foods are so expensive that poor families cannot afford it. The following link opens a paper on Tackling Poverty in Indigenous Communities in Canada   The following blog The Challenge of Feeding the North discusses food insecurity in remote communities in Canada This is a problem that has been at the forefront since Indigenous people have been placed on reservations.

## ORAL HEALTH

According to the Ontario Dental Hygienist's Association (n.d.), teeth are an integral part of overall health and with

proper care people can keep their teeth for a lifetime. Preschool aged children should be encouraged to build healthy eating habits to protect their teeth and encouraged to brush their teeth twice a day. When teeth are not well taken care of, children can suffer from oral infections and early childhood cavities (ECC). ECC is a severe form of tooth decay in the primary teeth of infants and toddlers. It affects more than 10% of preschool-age children in Canada. ECC can be caused by passing bacteria from the parent/caregiver to the child (e.g., through kisses, sharing toothbrushes, food and utensils), the amount of sugar and starches in the diet, and the time and frequency of feedings.

## Tips to support positive oral care in preschool aged children:

- At this stage caregivers should still need to supervise and help children brush and floss properly. The parent can check after the child has brushed.

- The best way to check the child's mouth after brushing is to stand behind the child so that both

are facing the mirror. Lift the lip to assess the gums and the back teeth.

- Toothpaste with fluoride should only be used when the child can rinse and spit properly because swallowing toothpaste with fluoride can permanently stain a child's adult teeth. Use only a small amount of toothpaste (pea-size or smaller).

- Encourage regular brushing and flossing as the child gets older.



Figure 9.10: A dentist checking a child's teeth. (Image by Keesler Air Force Base is in the public domain)

## PROTECTION FROM ILLNESS

Two important ways to help protect children from illness are immunization and hand-washing.

## IMMUNIZATIONS

While vaccines begin in infancy (as was discussed in Chapter 4), it is important for children to receive additional doses of vaccines to keep them protected. These boosters, given during the preschool years, are doses of the vaccines they received earlier in life to help them maintain the best protection against vaccine-preventable diseases.

Figure 9.11: Vaccines. (Image by Ramstein Air Base is in the public domain)

The following chart shows the recommended schedule of immunizations during childhood for the province of Ontario as of December 2016. For the most current recommendations according to the National Advisory Committee on Immunization and for each province and territory go to the Government of Canada website.

**Immunization Schedule**
The following is the recommended schedule of immunizations during childhood:

| Age | DTap-IPV-Hib | Pneu-C-13 | Rot | Men-C | MMR | Var | Tdap-IPV | MMR-Var | Men-C-A,C,Y,W-135 | HB** | HPV | Tdap | Inf |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 m | ✓ | ✓ | ✓ | | | | | | | | | | |
| 4 m | ✓ | ✓ | ✓ | | | | | | | | | | |
| 6 m | ✓ | ✓ | | | | | | | | | | | |
| 12 m | | ✓ | | ✓ | ✓ | | | | | | | | |
| 15 m | | | | | | ✓ | | | | | | | |
| 18 m | ✓ | | | | | | | | | | | | |
| 4-6 y | | | | | | | ✓ | | | | | | |
| Gr 7 | | | | | | | | | ✓ | ✓ | ✓ | | |
| 14-16 y | | | | | | | | | | | | ✓ | |
| Every year* | | | | | | | | | | | | | ✓ |

m=Month; y=Year; Gr=Grade
* The influenza vaccine is approved for use beginning at age 6 months.
** The Hep B vaccine is approved for use beginning at birth and should be given to babies whose parents or household contacts are known Hep B carriers.

www.aboutkidshealth.ca

Figure 9.12: Immunization Schedule (Government of Canada, 2021)

The Province of Ontario (2014), shares in the Child Care and Early Years Act, 2014 that families are to provide proof of immunization (or appropriate exemption documents) for certain diseases if their child attends a licensed childcare centre in Ontario. A child may be exempt from immunization requirements for medical reasons, philosophical reasons or religious reasons. It should be noted that children who are not vaccinated are at increased risk of disease and may be removed from the child care centre during a disease outbreak (Eastern Ontario Health Unit, 2021).

## HAND-WASHING

Hand-washing is one of the best ways to prevent the spread of illness. It's important for children (and adults) to wash their hands often, especially when they are likely to get and spread germs, including:

- Before, during, and after preparing food.
- Before eating food.
- After blowing nose, coughing, or sneezing.

- After using the toilet.

- After touching an animal, animal feed, or animal waste.

- After touching garbage.

It's important for children to learn how to properly wash their hands. When washing hands children (and adults) should follow these five steps every time.
   1. Wet your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
   2. Lather your hands by rubbing them together with the soap. Lather the backs of your hands, between your fingers, and under your nails.
   3. Scrub your hands for at least 20 seconds. Need a timer? Hum or sing the Happy Birthday song or ABCs from beginning to end twice.
   4. Rinse your hands well under clean, running water.
   5. Dry your hands using a clean towel or air dry them (Centres for Disease Control and Prevention, 2021).

Figure 9.13: A mother helping her son wash his hands. (Image is in the public domain)

Caregivers can help keep children healthy by:

- Teaching them good hand-washing techniques.

- Reminding their kids to wash their hands.

- Washing their own hands with the children (Centres for Disease Control and Prevention, 2020).

## SAFETY

Childhood injury is defined as "the physical damage that results when a human body is subjected to energy that exceeds the threshold of physiological tolerance or results in lack of one or more vital elements, such as oxygen" (Canadian Pediatric Society, 2020).
Through statistics shared via the Canadian Pediatric Society (2020),

- In Canada, injury is the leading cause of death for not only children, but for all Canadians between the ages of one and 44.

- Between 1994 and 2003, approximately 390 Canadian children age 14 years and under died from unintentional injuries annually, while another 25,500 were hospitalized.

- In 2004, injuries to Canadians cost $19.8 billion in health care costs and lost productivity, of which $16.0 billion resulted from unintentional causes. Of this, almost $3 billion could be accounted for by falls and

transport-related injuries to children and youth from birth to 19 years of age.

The most common causes of injury in preschool aged children are due to the following:

- **Falls:** Falls are the leading cause of injury in preschool aged children. Examples of how falls can occur are as follows: on the stairs and steps, off furniture, by slipping, tripping and stumbling, by using furniture to climb out windows or balconies, by not using age appropriate playground equipment, and/or on hard surfaces.

- **Choking, strangulation and suffocation** are leading causes of injury-related deaths for children in Canada. Children can be harmed by: choking on food and small objects, strangling from items such as ropes, blind cords, or draw strings in clothing, suffocating in cribs or beds, being left in a car.

- **Burns:** A child's skin burns four times faster and deeper than an adult's at the same temperature. Common causes of burns include: scalds from steam, hot water, tipped-over coffee cups, hot foods or cooking fluids, contact with flames or other hot objects such as curling iron or fireplace, chemical burns from items such as batteries or bleach, electrical burns from biting on electrical cords or sticking fingers or objects into outlets, too much exposure to the sun.

- **Poisoning:** Half of all poison exposures happen to children under five years of age. Common poisonous products: medications, household cleaners, alcohol, plants, fertilizers, pesticides, paint thinner, antifreeze, carbon monoxide

- **Drowning or near drowning:** All children are at risk for drowning but children under age five have a higher risk. It can happen quickly and silently in only a few centimetres of water.

(City of Toronto, 2021)

Childhood injuries are preventable. It is important for caregivers to consistently and thoroughly supervise young children.



Figure 9.14: Children playing on a jungle gym at a park. (Image is in the public domain)

**Summary**

In this chapter we looked at:

- The physical characteristics of preschoolers.

- Healthy nutrition.

- The changes in the brain.

- The progression of motor skills and developmentally appropriate ways to support that development.

- Sleep and sleep disorders.

- Toilet training and elimination disorders.

- And ways to keep children healthy and safe.

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**CHAPTER 10**

## Cognitive Development in the Preschool Years

Chapter Objectives

After this chapter, you should be able to:

- Compare and contrast Piaget and Vygotsky's beliefs about cognitive development.
- Explain the role of information processing in cognitive development.
- Discuss how preschool-aged children understand their worlds.
- Put cognitive milestones into the order in which they appear in typically developing children. Discuss how early child education supports development and how our understanding of development influence education.
- Describe autism spectrum disorder as atypical cognitive development

### INTRODUCTION

Understanding of cognitive development is advancing on many different fronts. One exciting area is linking changes in brain activity to changes in children's thinking (Nelson et al., 2006, as cited in Leon, n.d.). Although many people believe that brain maturation is something that occurs before birth, the brain actually continues to change in large ways for many years thereafter. For example, a part of the brain called the prefrontal cortex, which is located at the front of the brain and is particularly involved with planning and flexible problem solving, continues to develop throughout adolescence (Blakemore & Choudhury, 2006, as cited in Leon, n.d.).

### PRESCHOOL COGNITIVE SKILLS

The Continuum of Development (Ontario Ministry of Education, 2014) describes the core skills which are part of the preschool/ kindergarten stage of development. These skills are also reflected the overall and specific expectations in the four frames in Ontario's the Kindergarten Program (Ontario Ministry of Education, 2016). This document will be referred to throughout the chapters on preschool development.

Below is a summary of the core skills in preschool cognitive development as described in the Continuum of Development by Ontario Ministry of Education (2014).

During the preschool years children continue to observe their world, ask questions, and develop and test their

theories about how things work. During this stage of development children master new ways of describing and making meaning of their experiences.  At this stage their reasoning is more logical. They solve problems by collecting and organizing information, reflecting on it, drawing conclusions and communicating their findings with others. This may include the skills of classifying and seriating. Increased verbal abilities allow them to use spatial terms and positional words such as behind, inside, in front of, between. They can follow directions, creating and using maps.

Preschoolers' exploration of mathematics continues to grow with an increasing understanding of numeracy,  which includes counting in meaningful ways to determine quantity, comparing quantities, and completing simple number operations using number symbols. They explore ways to represent number such as tally marks. They demonstrate a growing ability to describe attributes of 2 dimensional figures and 3 dimensional solids, to identify patterns and show an interest in measurement, particularly linear measurement. They become more skilled at understanding time and how it is measured.

The ability to represent is demonstrated through using materials to express ideas which may be in the form of 2D and 3D creations.  In socio dramatic play preschoolers can take on a role pretending to be someone else, sustaining the play, and using props to tell a story. (Ontario Ministry of Education, 2014)

Early childhood is a time of pretending, blending fact and fiction, and learning to think of the world using language. As young children move away from needing to touch, feel, and hear about the world toward learning some basic principles about how the world works, they hold some interesting ideas. For example, while adults have no concerns with taking a bath, a child of three might genuinely worry about being sucked down the drain. A child might protest if told that something will happen "tomorrow" but be willing to accept an explanation that an event will occur "today after we sleep." Or the young child may ask, "How long are we staying? From here to here?" while pointing to two points on a table. Concepts such as tomorrow, time, size and distance are not easy to grasp at this young age. Understanding size, time, distance, fact and fiction are all tasks that are part of cognitive development in the preschool years.

## PIAGET'S PREOPERATIONAL INTELLIGENCE

Piaget's stage that coincides with early childhood is the **preoperational stage**. The word operational means logical, children are learning to use language and to think about the world symbolically. Let's examine some of Piaget's assertions about children's cognitive abilities at this age.

## MENTAL REPRESENTATION

As children move through substage 6 in sensorimotor development they begin to work with symbols, words ,and gestures to form an internal working model of their world. They demonstrate deferred imitation by imitating actions they have seen at a previous time. They begin to use objects to represent other things so a block can be a phone for example. These new skills support the emergence of make-believe play.

## PRETEND PLAY

Pretending is a favourite activity at this time. A toy has qualities beyond the way it was designed to function and can now be used to stand for a character or object unlike anything originally intended. A teddy bear, for example, can be a baby or the queen of a faraway land!



Figure 10.1: A child pretending to buy items at a toy grocery store. (Image by Ermalfaro is licensed under CC BY-SA 4.0)

According to Piaget, children's pretend play helps them solidify new schemes they were developing cognitively. This play, then, reflects changes in their conceptions or thoughts. However, children also learn as they take on roles. examine perspectives, pretend and experiment. Their play does not simply represent what they have learned (Berk, 2007, as cited Paris, Ricardo, Raymond, & Johnson, 2021). In their play they make meaning of their lived experiences and explore possibilities as they consider 'what is' and 'what if'?

### Indigenous Perspectives

This is the perfect age to introduce Indigenous Storytelling with role playing the animals in the story. Let them change the story and have fun with it. Children will see themselves in the story. This relates to what Piaget says: "In their play, they make meaning of their lived experiences and explore possibilities as they consider 'what is' and 'what if'?". Plenty of outdoor play will help to connect children to the land.

At this age, children also have to have clear directions in order to complete what they are asked to do. For example, if the child is not looking at you. You say listen to me. The child says "I am listening to you." The educator has to be precise in what they are asking of the child. It is important to note that a lot of Indigenous children might not look you in the eyes. This is a cultural thing.

## EGOCENTRISM

**Egocentrism** in early childhood refers to the tendency of young children to think that everyone sees things in the same way as the child. Piaget's classic experiment on egocentrism involved showing children a 3-dimensional model of a mountain and asking them to describe what a doll that is looking at the mountain from a different angle might see. Children tend to choose a picture that represents their own view, rather than that of the doll. However, children tend to use different sentence structures and vocabulary when addressing a younger child or an older adult. This indicates some awareness of the views of others.

Figure 10.2: Piaget's egocentrism experiment. (Image by Rosenfeld Media is licensed under CC BY 2.0)

## SYNCRETISM

**Syncretism** refers to a tendency to think that if two events occur simultaneously, one caused the other. Example: A family is planning to go on a picnic. The preschooler misbehaves by taking a toy away from their younger sibling who cries. The family reacts firmly to the situation. As they are sorting out the situation, they hear the sound of distant thunder and decide to postpone the picnic. The preschooler may believe that their behaviour caused the storm which resulted in the cancellation of the plans.

## ANIMISM

Attributing lifelike qualities to objects is referred to as animism.  The cup is alive, the chair that falls down and hits the child's ankle is mean, and the toys need to stay home because they are tired. Cartoons and animation frequentlyshow objects that appear alive and take on lifelike qualities. They may also think that a small gardening tool could grow up to be a full-size shovel. Young children do seem to think that objects that move may be alive but after age 3, they seldom refer to objects as being alive (Berk, 2007, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## CLASSIFICATION ERRORS

Preoperational children have difficulty understanding that an object can be classified in more than one way. For example, if shown three white buttons and four black buttons and asked whether there are more black buttons or buttons, the child is likely to respond that there are more black buttons. As the child's vocabulary improves and more schemes are developed, the ability to classify objects improves.

## CONSERVATION ERRORS

Conservation refers to the ability to recognize that moving or rearranging matter does not change the quantity. Let's look at an example. A father gave a slice of pizza to 10-year-old Keiko and another slice to 3-year-old Kenny. Kenny's pizza slice was cut into five pieces, so Kenny told his sister that he got more pizza than she did. Kenny did not understand that cutting the pizza into smaller pieces did not increase the overall amount. This was because

Kenny exhibited Centration or focused on only one characteristic or attribute of an object to the exclusion of others.

Kenny focused on the five pieces of pizza to his sister's one piece even though the total amount of pizza was the same. Keiko was able to consider several characteristics of an object rather than just one.

The classic Piagetian experiment associated with conservation involves liquid (Crain, 2005, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). As seen below, the child is shown two glasses (as shown in a) which are filled to the same level and asked if they have the same amount. Usually, the child agrees they have the same amount. The researcher then pours the liquid from one glass to a taller and thinner glass (as shown in b). The child is again asked if the two glasses have the same amount of liquid. The preoperational child will typically say the taller glass now has more liquid because it is taller. The child has concentrated on the height of the glass and fails to conserve (Lally & Valentine-French, 2019).
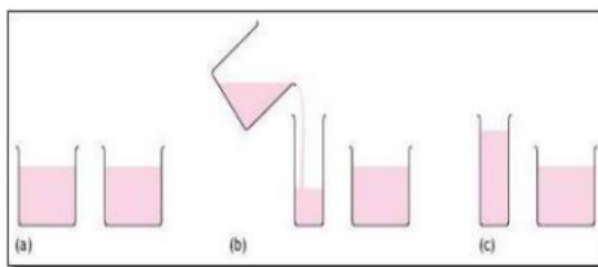


Figure 10.3: Piagetian liquid conservation experiments. (Image by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0)

## COGNITIVE SCHEMAS

As introduced in the first chapter, Piaget believed that in a quest for cognitive equilibrium, we use schemas (categories of knowledge) to make sense of the world. And when new experiences fit into existing schemas, we use assimilation to add that new knowledge to the schema. But when new experiences do not match an existing schema, we use accommodation to add a new schema. During early childhood, children use accommodation often as they build their understanding of the world around them.

## VYGOTSKY'S SOCIOCULTURAL THEORY OF DEVELOPMENT

**Zone of Proximal Development and Scaffolding**

Vygotsky's best-known concept is the zone of proximal development (ZPD). Vygotsky stated that children should be taught in the ZPD, which occurs when they can perform a task with assistance, but not quite yet on their own. With the right kind of teaching, however, they can accomplish it successfully. A good teacher identifies a child's ZPD and helps the child stretch beyond it. Then the adult (teacher) gradually withdraws support until the child can then perform the task unaided. Researchers have applied the metaphor of scaffolds (the temporary platforms on which construction workers stand) to this way of teaching. Scaffolding is the temporary support that parents or teachers give a child to do a task.

Figure 10.4: Zone of proximal development. (Image by Dcoetzee is licensed under CC0 1.0)

## PRIVATE SPEECH

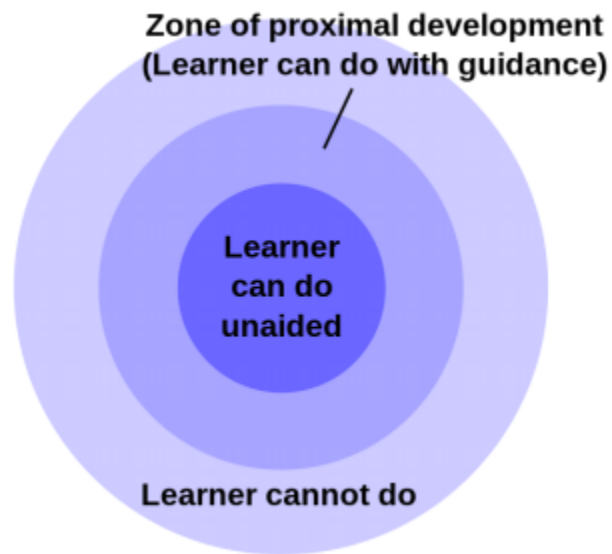Do you ever talk to yourself? Why? Chances are, this occurs when you are struggling with a problem, trying to remember something, or feel very emotional about a situation. Children talk to themselves too. Piaget interpreted this as egocentric speech or a practice engaged in because of a child's inability to see things from another's point of view. Vygotsky, however, believed that children talk to themselves in order to solve problems or clarify thoughts. As children learn to think in words, they do so aloud before eventually closing their lips to engage in private speech or inner speech.

Thinking out loud eventually becomes thought accompanied by internal speech, and talking to oneself becomes a practice only engaged in when we are trying to learn something or remember something. This inner speech is not as elaborate as the speech we use when communicating with others (Vygotsky, 1962, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## CONTRAST WITH PIAGET

Piaget was highly critical of teacher-directed instruction, believing that teachers who take control of the child's learning place the child into a passive role (Crain, 2005, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Further, teachers may present abstract ideas without the child's true understanding, and instead they just repeat back what they heard. Piaget believed children must be given opportunities to discover concepts on their own. As previously stated, Vygotsky did not believe children could reach a higher cognitive level without instruction from more learned individuals. Who is correct? Both theories certainly contribute to our understanding of how children learn.

## INFORMATION PROCESSING

Information processing researchers have focused on several issues in cognitive development for this age group, including improvements in attention skills, changes in the capacity, and the emergence of executive functions in working memory. Additionally, in early childhood memory strategies, memory accuracy, and autobiographical

memory emerge. Early childhood is seen by many researchers as a crucial time period in memory development (Posner & Rothbart, 2007, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).
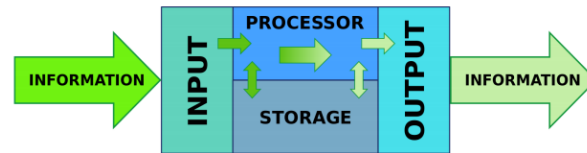


Figure 10.5: How information is processed. (Image by Gradient drift is in the public domain)

## ATTENTION

Changes in attention have been described by many as the key to changes in human memory (Nelson & Fivush, 2004; Posner & Rothbart, 2007, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). However, attention is not a unified function; it is comprised of sub-processes. The ability to switch our focus between tasks or external stimuli is called divided attention or multitasking. This is separate from our ability to focus on a single task or stimulus, while ignoring distracting information, called selective attention. Different from these is sustained attention, or the ability to stay on task for long periods of time. Moreover, we also have attention processes that influence our behaviour and enable us to inhibit a habitual or dominant response, and others that enable us to distract ourselves when upset or frustrated.

## SELECTIVE ATTENTION

Children's ability with selective attention tasks, improve as they age. However, this ability is also greatly influenced by the child's temperament (Rothbart & Rueda, 2005, as cited Paris, Ricardo, Raymond, & Johnson, 2021), the complexity of the stimulus or task (Porporino, Shore, Iarocci & Burack, 2004), and whether the stimuli are visual or auditory (Guy, Rogers & Cornish, 2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Guy et al. (2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) found that children's ability to selectively attend to visual information outpaced that of auditory stimuli. This may explain why young children are not able to hear the voice of the teacher over the cacophony of sounds in the typical preschool classroom (Jones, Moore & Amitay, 2015, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Jones and his colleagues found that 4- to 7-year-olds could not filter out background noise, especially when its frequencies were close in sound to the target sound. In comparison, 8- to 11-year-old children often performed similar to adults.



Figure 10.6:  A child playing a game that measures their sustained attention. (Image by Fabrice Florin is licensed under CC BY-SA 2.0)

## MEMORY

Based on studies of adults, people with amnesia, and neurological research on memory, researchers have proposed several "types" of memory (see Figure 4.14). Sensory memory (also called the sensory register) is the first stage of the memory system, and it stores sensory input in its raw form for a very brief duration; essentially long enough for the brain to register and start processing the information. Studies of auditory sensory memory show that it lasts about one second in 2-year-olds, two seconds in 3-year-olds, more than two seconds in 4-year-olds, and three to five seconds in 6-year-olds (Glass, Sachse, & von Suchodoletz, 2008, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Other researchers have also found that young children hold sounds for a shorter duration than do older children and adults, and that this deficit is not due to attentional differences between these age groups, but reflects differences in the performance of the sensory memory system (Gomes et al., 1999, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). The second stage of the memory system is called short-term or working memory. Working memory is the component of memory in which current conscious mentalactivity occurs.

Working memory often requires conscious effort and adequate use of attention to function effectively. As you read earlier, children in this age group struggle with many aspects of attention and this greatly diminishes their ability to consciously juggle several pieces of information in memory. The capacity of working memory, that is the amount of information someone can hold in consciousness, is smaller in young children than in older children and adults. The typical adult and teenager can hold a 7-digit number active in their short-term memory. The typical 5-year-old can hold only a 4-digit number active. This means that the more complex a mental task is, the less efficient a younger child will be in paying attention to, and actively processing, information in order to complete the task.

Changes in attention and the working memory system also involve changes in executive function. Executive function (EF) refers to self-regulatory processes, such as the ability to inhibit a behaviour or cognitive flexibility, that enable adaptive responses to new situations or to reach a specific goal. Executive function skills gradually emerge during early childhood and continue to develop throughout childhood and adolescence. Like many cognitive changes, brain maturation, especially the prefrontal cortex, along with experience influence the development of executive function skills.

A child shows higher executive functioning skills when the parents are more warm and responsive, use scaffolding when the child is trying to solve a problem, and provide cognitively stimulating environments for the child (Fay-Stammbach, Hawes & Meredith, 2014, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). For instance, scaffolding was positively correlated with greater cognitive flexibility at age two and inhibitory control at age four (Bibok, Carpendale & Müller, 2009, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). In Schneider, Kron-Sperl and Hunnerkopf's (2009, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) longitudinal study of 102 kindergarten children, the majority of children used no strategy to remember information, a finding that was consistent with previous research. As a result, their memory performance was poor when compared to their abilities as they aged and started to use more effective memory strategies.

The third component in memory is long-term memory, which is also known as permanent memory. A basic division of long- term memory is between declarative and non-declarative memory. **Declarative memories**, sometimes referred to as explicit memories, are memories for facts or events that we can consciously recollect. Declarative memory is further divided into semantic and episodic memory. **Semantic memories** are memories for

facts and knowledge that are not tied to a timeline,  e**pisodic memories** are tied to specific events in time.  **Non- declarative memories**, sometimes referred to as implicit memories, are typically automated skills that do not require conscious recollection.

## NEO-PIAGETIANS

As previously discussed, Piaget's theory has been criticized on many fronts, and updates to reflect more current research have been provided by the Neo-Piagetians, or those theorists who provide "new" interpretations of Piaget's theory. Morra, Gobbo, Marini and Sheese (2008, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) reviewed Neo-Piagetian theories, which were first presented in the 1970s, and identified how these "new" theories combined Piagetian concepts with those found in Information Processing. Similar to Piaget's theory, Neo-Piagetian theories believe in constructivism, assume cognitive development can be separated into different stages with qualitatively different characteristics, and advocate that children's thinking becomes more complex in advanced stages. Unlike Piaget, Neo-Piagetians believe that aspects of information processing change the complexity of each stage, not logic as determined by Piaget.

Neo-Piagetians propose that working memory capacity is affected by biological maturation, and therefore restricts young children's ability to acquire complex thinking and reasoning skills. Increases in working memory performance and cognitive skills development coincide with the timing of several neurodevelopmental processes. These include myelination, axonal and synaptic pruning, changes in cerebral metabolism, and changes in brain activity (Morra et al., 2008, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

Myelination especially occurs in waves between birth and adolescence, and the degree of myelination in particular areas explain the increasing efficiency of certain skills. Therefore, brain maturation, which occurs in spurts, affects how and when cognitive skills develop. Additionally, all Neo-Piagetian theories support that experience and learning interact with biological maturation in shaping cognitive development (Lally & Valentine-French, 2019).

## CHILDREN'S UNDERSTANDING OF THE WORLD

Both Piaget and Vygotsky believed that children actively try to understand the world around them. More recently developmentalists have added to this understanding by examining how children organize information and develop their own theories about the world.

## THEORY-THEORY

The tendency of children to generate theories to explain everything they encounter is called theory-theory. This concept implies that humans are naturally inclined to find reasons and generate explanations for why things occur. Children frequently ask questions about what they see or hear around them. When the answers provided do not satisfy their curiosity or are too complicated for them to understand, they generate their own theories. In much the same way that scientists construct and revise their theories, children do the same with their intuitions about the world as they encounter new experiences (Gopnik & Wellman, 2012, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). One of the theories they start to generate in early childhood centers on the mental states; both their own and those of others.

Figure 10.7: What theories might this boy be creating? (Image by Eglin Air Force Base is in the public domain)

## THEORY OF MIND

Theory of mind refers to the ability to think about other people's thoughts. This mental mind reading helps humans to understand and predict the reactions of others, thus playing a crucial role in social development. One common method for determining if a child has reached this mental milestone is the false belief task, described below.

The research began with a clever experiment by Wimmer and Perner (1983, as cited in Paris, Ricardo, Raymond, & Johnson, 2021), who tested whether children can pass a false-belief test (see Figure 4.17). The child is shown a picture story of Sally, who puts a ball in a basket and leaves the room. While Sally is out of the room, Anne comes along and takes the ball from the basket and puts it inside a box. The child is then asked where Sally thinks the ball is located when Sally comes back to the room. Will they look first in the box or in the basket? The right answer is that they will look in the basket, because that's where Sally put it and thinks it is; but we have to infer this false belief against our own better knowledge that the ball is in the box.



Figure 10.8: A ball. (Image is in the public domain)



Figure 10.9: A basket. (Image is in the public domain)

Figure 10.10: A box. (Image is licensed under CC0)

This is very difficult for children before the age of four because of the cognitive effort it takes. Three-year-olds have difficulty distinguishing between what they once thought was true and what they now know to be true. They feel confident that what they know now is what they have always known (Birch & Bloom, 2003, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Even adults need to think through this task (Epley, Morewedge, & Keysar, 2004, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

To be successful at solving this type of task the child must separate what they "know" to be true from what someone else might "think" is true. In Piagetian terms, they must give up a tendency toward egocentrism. The child must also understand that what guides people's actions and responses are what they "believe" rather than what is reality. In other words, people can mistakenly believe things that are false and will act based on this false knowledge. Consequently, prior to age four children are rarely successful at solving such a task (Wellman, Cross & Watson, 2001, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Researchers examining the development of theory of mind have been concerned by the overemphasis on the mastery of false belief as the primary measure of whether a child has attained theory of mind. Wellman and his colleagues (Wellman, Fang, Liu, Zhu & Liu, 2006, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) suggest that theory of mind is comprised of a number of components, each with its own developmental timeline (see Table 4.2).

Two-year-olds understand the diversity of desires, yet as noted earlier it is not until age four or five that children grasp false belief, and often not until middle childhood do they understand that people may hide how they really feel. In part, because children in early childhood have difficulty hiding how they really feel.

This awareness of the existence of theory of mind is part of social intelligence, such as recognizing that others can think differently about situations. It helps us to be self-conscious or aware that others can think of us in different ways and it helps us to be able to be understanding or be empathetic toward others. Moreover, this mind-reading ability helps us to anticipate and predict people's actions. The awareness of the mental states of others is important for communication and social skills (Lally & Valentine-French, 2019).

The many theories of cognitive development and the different research that has been done about how children understand the world has allowed researchers to study the milestones that children who are typically developing experience in early childhood. Understanding how children think and learn has proven useful for improving education.

In 2010, Ontario introduced the full day kindergarten program which was fully implemented by 2014. Children can attend the program at 3 years 8 month of age. There is a year one and a year two of the program. In 2016 The Kindergarten Program document was released describing a play-based curriculum which includes four frames to

guide teaching, learning and assessment of learning. Overall and specific expectations are described in each of the four frames.
The frames are:

- Self-regulation and Well-Being

- Belonging and Contributing

- Problem Solving and Innovating

- Demonstrating Literacy and Mathematics Behaviours

In each kindergarten classroom an RECE and a qualified teacher registered with the Ontario College of Teachers (OCT) work in partnership as an educator team to implement the curriculum. There is an expectation for the educator team to observe children's play, 'notice and name' the learning and assess individual progress against the Overall and Specific Expectations. The progress is formally shared with families as their child moves through Year One and Year Two of the Kindergarten Program. In the delivery of the curriculum the educator team provides opportunities for children to demonstrate the expectations, and design and implement learning opportunities specifically related to the expectations. Two of the four frames; Problem Solving and Innovating and Demonstrating Literacy and Mathematics Behaviours relate directly to children's cognitive development. In the latter frame children are expected to, for example, use language to communicate their thinking and to solve problems, to demonstrate an interest in writing and reading, to demonstrate cardinality and the ability to subitize, to describe the properties of three-dimensional solids and to identify, create and describe simple patterns in mathematical terms (Ontario Ministry of Education, 2016).

## APPLICATION OF "THE KINDERGARTEN PROGRAM" TO THE EARLY YEARS

Even before they enter kindergarten, the mathematical knowledge of children from low-income backgrounds lags far behind that of children from more affluent backgrounds. Ramani and Siegler (2008, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) hypothesized that this difference is due to the children in middle- and upper-income families engaging more frequently in numerical activities, for example playing numerical board games such as Chutes and Ladders. Chutes and Ladders is a game with a number in each square; children start at the number one and spin a spinner or throw a dice to determine how far to move their token. Playing this game seemed likely to teach children about numbers, because in it, larger numbers are associated with greater values on a variety of dimensions. In particular, the higher the number that a child's token reaches, the greater the distance the token will have traveled from the starting point, the greater the number of physical movements the child will have made in moving the token from one square to another, the greater the number of number-words the child will have said and heard, and the more time will have passed since the beginning of the game. These spatial, kinesthetic, verbal, and time- based cues provide a broad-based, multisensory foundation for knowledge of numerical magnitudes (the sizes of numbers), a type of knowledge that is closely related to mathematics achievement test scores (Booth & Siegler, 2006, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).
Playing this numerical board game for roughly 1 hour, distributed over a 2-week period, improved low-income children's knowledge of numerical magnitudes, ability to read printed numbers, and skill at learning novel arithmetic problems. The gains lasted for months after the game-playing experience (Ramani & Siegler, 2008; Siegler & Ramani, 2009, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). An advantage of this type of educational intervention is that it has minimal if any cost—a parent could just draw a game on a piece of paper.

## AUTISM: DEFINING SPECTRUM DISORDER

Sometimes children's brains work differently. One form of this neuro-diversity is Autism Spectrum Disorder (ASD). ASD describes a range of conditions classified as neuro-developmental disorders in the fifth revision of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-5). The DSM-5, published in 2013, redefined the autism spectrum to encompass the previous (DSM-IV-TR) diagnoses of autism, Asperger syndrome, pervasive developmental disorder not otherwise specified (PDD-NOS), and childhood disintegrative disorder. These disorders are characterized by social deficits and communication difficulties, repetitive behaviours and interests, sensory issues, and in some cases, cognitive delays.

Autism spectrum disorders are considered to be on a spectrum because each individual with ASD expresses the disorder uniquely and has varying degrees of functionality. Many have above-average intellectual abilities and excel in visual skills, music, math, and the arts, while others have significant disabilities and are unable to live independently. About 25 percent of individuals with ASD are nonverbal; however, they may learn to communicate using other means.

In Canada 1 in 66 children between the ages of 5 and 17 years of age are diagnosed on the ASD spectrum (Government of Canada, 2018). Males are four times more likely to be diagnosed than females. The statistics are one in 44 males compared to one in 165 females (Government of Canada, 2018).

### Summary

In this chapter we looked at:

- Piaget's preoperational stage.

- Vygotsky's sociocultural theory.

- Information processing.

- How young children understand the world.

- The Full Day Kindergarten Program

- Autism spectrum disorder.

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**CHAPTER 11**

# Social Development in the Preschool Years

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**Chapter Objectives**

After this chapter, you should be able to:

- Describe the continuum of development of social skills in preschoolers.
- Compare and contrast different styles of parenting.
- Discuss the role of siblings and peers.
- Describe the types of play.
- Discuss the development of social understanding in preschoolers.
- Summarize the influences on social and emotional competence.

## INTRODUCTION

In the preschool years, children's understanding of their role in the world expands greatly. Let's examine some of the important interactions in social development between the ages of 2.5 and 6 years.

## CONTINUUM OF DEVELOPMENT

The Continuum of Development set out in *Early Learning for Every Child Today: A framework for Ontario early childhood settings* identifies several root social skills that are emerging in children between 2.5 and 6 years of age. Seeking out and making friends gains importance during the preschool years. This is facilitated by improved skills in conflict resolution, social problem-solving skills, peer group entry skills and co-operation. Preschoolers are more competent at identifying emotions in others, taking another person's point of view, empathizing and offering help. These emerging competencies improve the preschooler's ability to interact with others positively and respectfully. Preschoolers often seek out adult attention and approval and have developed the social skills to do so in a positive manner (Ontario Ministry of Education, 2014).

## FAMILY LIFE

Relationships between parents and children continue to play a significant role in children's development during early childhood. We will explore two models of parenting styles. Keep in mind that most parents do not follow any

model completely. In reality, people tend to fall somewhere in between these styles. And sometimes parenting styles change from one child to the next or in times when the parent has more or less time and energy for parenting. Parenting styles can also be affected by concerns the parent has in other areas of their life. For example, parenting styles tend to become more authoritarian when parents are tired and perhaps more authoritative when they are more energetic. Sometimes, parents seem to change their parenting approach when others are around, maybe because they become more self-conscious as parents or are concerned with giving others the impression that they are a "tough" parent or an "easy-going" parent. And of course, parenting styles may reflect the type of parenting someone saw modelled while growing up.



Figure 11.1: A family playing outside together. (Image from Unsplash)

**Indigenous Perspectives**

Parenting styles are different in Indigenous people's family life. For instance, in many nations, aunties and uncles are the ones who discipline the children to keep harmony in the home. Grandparents offer teachings and show cultural and traditional ways of life; they also sometimes discipline but in a different way.

## Baumrind

Diana Baumrind (1971, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) offers a model of parenting that includes four styles. The first, authoritarian, is the traditional model of parenting in which parents make the rules and children are expected to be obedient. Baumrind suggests that authoritarian parents tend to place maturity demands on their children that are unreasonably high and tend to be aloof and distant. Consequently, children reared in this way may fear rather than respect their parents and, because their parents do not allow discussion, may take out their frustrations on safer targets-perhaps as bullies toward peers.

Permissive parenting involves holding expectations of children that are below what could be reasonably expected from them. Children are allowed to make their own rules and determine their own activities. Parents are warm and communicative, but provide little structure for their children. Children fail to learn self-discipline and may feel somewhat insecure because they do not know the limits.

Authoritative parenting involves being appropriately strict, reasonable, and affectionate. Parents allow negotiation where appropriate and discipline matches the severity of the offense. In Ontario, many EarlyON Child and Family Centres offer parenting programs, including **Triple P (Positive Parenting Program)** and **Nobody's Perfect.**

Uninvolved parents (also referred to as rejecting/neglecting) are disengaged from their children. They do not make demands on their children and are non-responsive. These children can suffer in school and in their relationships with their peers (Gecas & Self, 1991, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## Lemasters and Defrain

Lemasters and Defrain (1989, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) offer another model of parenting. This model is interesting because it looks more closely at the motivations of the parent and suggests that parenting styles are often designed to meet the psychological needs of the parent rather than the developmental needs of the child.

The martyr is a parent who will do anything for the child; even tasks that the child should do for themself. All of the good deeds performed for the child, in the name of being a "good parent", may be used later should the parent want to gain compliance from the child. If a child goes against the parent's wishes, the parent can remind the child of all of the times the parent helped the child and evoke a feeling of guilt so that the child will do what the parent wants. The child learns to be dependent and manipulative as a result.

The pal is like the permissive parent described previously in Baumrind's model. The pal wants to be the child's friend. Perhaps the parent is lonely or perhaps the parent is trying to win a popularity contest against an ex-spouse. Pals let children do what they want and focus mostly on being entertaining and fun and set few limitations. Consequently, the child may have little self-discipline and may try to test limits with others.

The police officer/drill sergeant style of parenting is similar to the authoritarian parent described by Baumrind. The parent focuses primarily on making sure that the child is obedient and that the parent has full control of the child. Sometimes this can be taken to extreme by giving the child tasks that are really designed to check on their level of obedience. For example, the parent may require that the child fold the clothes and place items back in the drawer in a particular way. If not, the child might be scolded or punished for not doing things "right". This type of parent has a very difficult time allowing the child to grow and learn to make decisions independently. And the child may have a lot of resentment toward the parent that is displaced on others.

The teacher-counselor parent is one who pays a lot of attention to expert advice on parenting and who believes that as long as all of the steps are followed, the parent can rear a perfect child. "What's wrong with that?" you might ask. There are two major problems with this approach. First, the parent is taking all of the responsibility for the child's behavior-at least indirectly. If the child has difficulty, the parent feels responsible and thinks that the solution lies in reading more advice and trying more diligently to follow that advice.

Parents can certainly influence children, but thinking that the parent is fully responsible for the child's outcome is misguided. A parent can only do so much and can never have full control over the child. Another problem with this approach is that the child may get an unrealistic sense of the world and what can be expected from others. For example, if a teacher-counselor parent decides to help the child build self-esteem and has read that telling the child how special they are or how important it is to compliment the child on a job well done, the parent may convey the message that everything the child does is exceptional or extraordinary. A child may come to expect that all of their efforts warrant praise and in the real world, this is not something one can expect. Perhaps children get more of a sense of pride from assessing their own performance than from having others praise their efforts.



Figure 11.2: A father interacting with their son who is drawing a picture. He could be portraying the style of teacher-counselor or athletic coach. (Google Images)

So what is left? Lemasters and Defrain (1989, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) suggest that the athletic coach style of parenting is best. Before you draw conclusions here, set aside any negative experiences you may have had with coaches in the past. The principles of coaching are what are important to Lemasters and Defrain. A coach helps players form strategies, supports their efforts, gives feedback on what went right and what went wrong, and stands at the sideline while the players perform. Coaches and referees make sure that the rules of the game are followed and that all players adhere to those rules. Similarly, the athletic coach as parent helps the child understand what needs to happen in certain situations whether in friendships, school, or home life, and encourages and advises the child about how to manage these situations. The parent does not intervene or do things for the child. Their role is to provide guidance while the child learns firsthand how to handle these situations. And the rules for behavior are consistent and objective and presented in that way. So, a child who is late for dinner might hear the parent respond in this way, "Dinner was at six o'clock." Rather than, "You know good and well that we always eat at six. If you expect me to get up and make something for you now, you have got another thing coming! Just who do you think you are showing up late and looking for food? You're grounded until further notice!"

The most important thing to remember about parenting is that you can be a better, more objective parent when you are directing your actions toward the child's needs and while considering what they can reasonably be expected to do at their stage of development. Parenting is more difficult when you are tired and have psychological needs that interfere with the relationship. Some of the best advice for parents is to try not to take the child's actions personally and be as objective as possible.

**Indigenous Perspectives**

First Nation parenting would likely fall under the athletic coach style of parenting in all aspects referred to in the textbook, with a twist. Each extended family members and some community members would play a different role. They would all help the player form strategies, support their efforts, give feedback on what went right and what went wrong (through teachings and storytelling), and stand at the sideline while

the players perform. Elders and grandparents are the knowledge keepers that would give the teachings and guide the player (child) through storytelling. It is well known in our culture that children see themselves through the animal characters from the stories we use by which they learn values and lessons. Or they might choose a real-life story to help them learn a lesson.

## Cultural Influences on Parenting Styles

The impact of class and culture cannot be ignored when examining parenting styles. The two models of parenting described above assume that authoritative and athletic coaching styles are best because they are designed to help the parent raise a child who is independent, self-reliant and responsible. These are qualities favored in "individualistic" cultures.

Canadian First Nation cultural groups, while diverse, all stress the critical importance of parenting during the first seven years. "In addition to parenting our children, we also are parenting our grandchildren, those yet to be born." (Best Start Resource Centre, 2010 ). Parents, extended family, elders and the community are all responsible for providing unconditional love and discipline. Children are encouraged to make their own decisions (from among acceptable choices) and allowed to make mistakes. Story-telling is used to help teach children important life lessons. Modeling desirable behavior is another key teaching tool. First Nations cultures strongly believe that children are to be treated as equals and never talked down, belittled or bribed as a form of discipline.



Figure 11.3: A family from a collectivistic culture. (Image by the National Cancer Institute from Unsplash)

In "collectivistic" cultures such as China or Korea, being obedient and compliant are favored behaviors. Authoritarian parenting has been used historically and reflects cultural need for children to do as they are told. In societies where family members' cooperation is necessary for survival, as in the case of raising crops, rearing children who are independent and who strive to be on their own makes no sense. But in an economy based on being mobile in order to find jobs and where one's earnings are based on education, raising a child to be independent is very important.

Working class parents are more likely than middle class parents to focus on obedience and honesty when raising their children. In a classic study on social class and parenting styles called Class and Conformity, Kohn (1977, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) explains that parents tend to emphasize qualities that are needed for their own survival when parenting their children. Working class parents are rewarded for being obedient, reliable, and honest in their jobs. They are not paid to be independent or to question the management; rather, they move up and are considered good employees if they show up on time, do their work as they are told,

and can be counted on by their employers. Consequently, these parents reward honesty and obedience in their children.

Middle class parents who work as professionals are rewarded for taking initiative, being self-directed, and assertive in their jobs. They are required to get the job done without being told exactly what to do. They are asked to be innovative and to work independently. These parents encourage their children to have those qualities as well by rewarding independence and self-reliance. Parenting styles can reflect many elements of culture (Lumen Learning, n.d.).

**Indigenous Perspectives**

Due to the residential school legacy, laws have been put in place regarding the placement of children in non-indigenous families in foster care. For some but not all, the law states that the child will stay in the FN community whereby parents will go through cultural programming and healing to reintegrate the child back into the home. Also there is the issue of displacement for children from remote First Nation communities who do not have either elementary and/or secondary schools. Many grandparents or aunts and uncles decide to move out of the community to urban areas to take care of the children. Subsequently, other extended family members would be rearing the child/ren.

## Changing Families in a Changing Society

The sociology of the family examines the family as an institution and a unit of socialization. Sociological studies of the family look at demographic characteristics of the family members: family size, age, ethnicity and gender of its members, social class of the family, the economic level and mobility of the family, professions of its members, and the education levels of the family members.

Currently, one of the biggest issues that sociologists study are the changing roles of family members. Often, each member is restricted by the gender roles of the traditional family. These roles, such as the father as the breadwinner and the mother as the homemaker, are declining. Now, the mother is often the supplementary provider while retaining the responsibilities of child rearing. In this scenario, females' role in the labor force is "compatible with the demands of the traditional family." Sociology studies the adaptation of males' role to caregiver as well as provider. The gender roles are becoming increasingly interwoven.

**Indigenous Perspectives**

The same can be said about the roles of women in certain First Nations. Traditionally the men were the hunters; however, it is not uncommon today to see young women hunting with a male relative. Women have always had a major role to play in FN societies. Whether it is a matriarchal or patriarchal society, men have high regard for women. This view changed with colonization. The same can be said about women as the breadwinner (hunters).

## Diverse Family Forms

A single parent family usually refers to a parent who has most of the day-to-day responsibilities in the raising of the child or children, who is not living with a spouse or partner, or who is not married. The dominant caregiver is the parent with whom the children reside the majority of the time. If the parents are separated or divorced, children might live with their custodial parent and have visitation with their noncustodial parent. In western society in general, following separation a child will end up with the primary caregiver, usually the mother, and a secondary caregiver, usually the father.  Divorced or separated parents can also share custody, which often means that the

child spends an equal amount of time with each parent. Family courts in Ontario will often work with a family to come up with a schedule that works for both parents, so that the child may spend certain days with each parent or they may have a week by week schedule.

There is a growing community of single parent by choice families in which a family is built by a single adult (through foster care, adoption, donor gametes and embryos, and surrogacy).



Figure 11.4: A single-parent family. (Image is in the Public Domain)

Cohabitation (also known as a common law relationship) is an arrangement where two people who are not married live together in an intimate relationship, particularly an emotionally and/or sexually intimate one, on a long-term or permanent basis. Today, cohabitation is a common pattern among people in the Western world. The 2016 Canadian census found common law couples make up 21.3% of all couples. Regional differences are significant. Quebec at 39.9%, Nunavut at 50.3%, Northwest Territories at 36.6% and Yukon at 31.9% were well above the average of 15.7% for the rest of Canada. (reference: Families, households and marital status (Statistics Canada, 2017a).

Gay and lesbian couples are categorized as same-sex relationships. Prior to 2005, cohabitation was the only choice for same-sex couples to live together in an intimate relationship in Canada. Same-sex marriage became legal in Canada in 2005 with the passage of the federal Civil Marriage Act. According to the 2016 Canadian census, same-sex couples represent 0.9% of all couples. Approximately 33% of those couples are married. The 2016 Canadian census also found that about 12% of same-sex couples (cohabitating or married) have children living with them (Statistics Canada, 2017b).

Figure 11.5: A family with parents of the same sex. (Image by Emily Walker is licensed under CC BY-SA 2.0)

Indigenous Perspectives

Traditionally, one of the roles of Two Spirit people (what society now refers to LGTBQ2S) was sometimes the rearing of the children for Medicine women.

## MULTIGENERATIONAL FAMILIES

According to Statistics Canada, in 2011 approximately 600,000 grandparents aged 45 and older lived in the same household as their grandchildren. This represented about 8% of all grandparents in that age group. However, significant differences among cultural groups were found. 11% of grandparents who identified as Aboriginal (First Nations People, Metis or Inuit) lived with their grandchildren. This percentage increased to 22% in the Inuit population. 21% of recent immigrants to Canada (arriving between 2006 and 2011) aged 45 and older co-resided with grandchildren. These percentages are all significantly higher than the 3% of non-Indigenous Canadian-born grandparents who live in the same household as their grandchildren (Statistics Canada, 2015).

Today's grandparent is healthier and will live longer than previous generations. While they may or may not co-reside with their grandchildren, many contribute to family life, perhaps choosing to provide child care or helping out financially. Evolving family composition has increased the need for non-parental child care. According to Statistics Canada (2015), in 2014, 69% of couples in Canada with children included 2 earners, up from just 36% in 1976. Likewise, the percentage of lone-parent families has increased from 1 in 10 in 1976 to approximately 1 in 5 in 2014.

Two factors can lead to grandparents being turned to for child care; lack of available, high quality, regulated child care and the cost. Availability varies among provinces and territories, but the need continues to far exceed availability across Canada. While there are many variables that go into the cost of child care (e.g.: urban versus rural, age of the child, centre-based versus home-based), as an example, "Ontario's Early Years and Child Care Annual Report 2020" found median parent fees for licensed centre-based care ranged from $66/day for infants to $22/day for school-aged children (Province of Ontario, 2021). "Research shows that grandparent involvement in family life is significantly associated with child well-being, including greater prosocial behaviors and school involvement" (Vanier Institute, 2017). This is particularly true among First Nations families, where grandparents are valued for their role in supporting cultural well-being in younger generations.

## SIBLING RELATIONSHIPS

Siblings typically spend a considerable amount of time with each other and offer a unique relationship that is not found with same-age peers or with adults. Siblings play an important role in the development of social skills. Cooperative and pretend play interactions between younger and older siblings can teach empathy, sharing, and cooperation (Pike, Coldwell, & Dunn, 2005, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) as well as negotiation and conflict resolution (Abuhatoum & Howe, 2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). However, the quality of sibling relationships is often mediated by the quality of the parent-child relationship and the psychological adjustment of the child (Pike et al., 2005, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). For instance, more negative interactions between siblings have been reported in families where parents had poor patterns of communication with their children (Brody, Stoneman, & McCoy, 1994, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Children who have emotional and behavioral problems are also more

likely to have negative interactions with their siblings. However, the psychological adjustment of the child can sometimes be a reflection of the parent-child relationship. Thus, when examining the quality of sibling interactions, it is often difficult to tease out the separate effect of adjustment from the effect of the parent-child relationship.

While parents want positive interactions between their children, conflicts are going to arise, and some confrontations can be the impetus for growth in children's social and cognitive skills. The sources of conflict between siblings often depend on their respective ages. Dunn and Munn (1987, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) revealed that over half of all sibling conflicts in early childhood were disputes about property rights. By middle childhood this starts shifting toward control over social situations, such as what games to play, disagreements about facts or opinions, or rude behavior (Howe, Rinaldi, Jennings, & Petrakos, 2002, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Researchers have also found that the strategies children use to deal with conflict change with age, but that is also tempered by the nature of the conflict.

Abuhatoum and Howe (2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) found that coercive strategies (e.g., threats) were preferred when the dispute centered on property rights, while reasoning was more likely to be used by older siblings and in disputes regarding control over the social situation. However, younger siblings also use reasoning, frequently bringing up the concern of legitimacy (e.g., "You're not the boss") when in conflict with an older sibling. This is a very common strategy used by younger siblings and is possibly an adaptive strategy in order for younger siblings to assert their autonomy (Abuhatoum & Howe, 2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). A number of researchers have found that children who can use non-coercive strategies are more likely to have a successful resolution, whereby a compromise is reached and neither child feels slighted (Ram & Ross, 2008; Abuhatoum & Howe, 2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

Not surprisingly, friendly relationships with siblings often lead to more positive interactions with peers. The reverse is also true. A child can also learn to get along with a sibling, with, as the song says "a little help from my friends" (Kramer & Gottman, 1992, as cited in Lally & Valentine-French, 2019).



Figure 11.6: Siblings. (Image by LEONARDO DASILVA is licensed under CC BY 2.0)

## PEERS

Relationships within the family (parent-child and siblings) are not the only significant relationships in a child's life. Peer relationships are also important. Social interaction with another child who is similar in age, skills, and knowledge provokes the development of many social skills that are valuable for the rest of life (Bukowski, Buhrmester, & Underwood, 2011, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). In peer relationships, children learn how to initiate and maintain social interactions with other children. They learn skills for managing

conflict, such as turn-taking, compromise, and bargaining. Play also involves the mutual, sometimes complex, coordination of goals, actions, and understanding. For example, as preschoolers engage in pretend play they create narratives together, choose roles, and collaborate to act out their stories. Through these experiences, children develop friendships that provide additional sources of security and support to those provided by their parents.



Figure 11.7: Navigating dramatic play provides great opportunities to continue to develop social skills with same-age peers. (Google Images)

However, peer relationships can be challenging as well as supportive (Rubin, Coplan, Chen, Bowker, & McDonald, 2011, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Being accepted by other children is an important source of affirmation and self-esteem, but peer rejection can foreshadow later behavior problems (especially when children are rejected due to aggressive behavior).

Peer relationships require developing very different social and emotional skills than those that emerge in parent-child relationships. They also illustrate the many ways that peer relationships influence the growth of personality and self-concept (Leon, n.d.).

## PLAY

Freud saw play as a means for children to release pent-up emotions and to deal with emotionally distressing situations in a more secure environment. Vygotsky and Piaget saw play as a way of children developing their intellectual abilities (Dyer & Moneta, 2006, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Piaget created stages of play that correspond with the stages of cognitive development. The stages are:

**Table 11.1: Piaget's Stages of Play** (Grounds for Play, n.d., as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

| Stage | Description |
| --- | --- |
| Functional Play | Exploring, inspecting, and learning through repetitive physical activity. |
| Symbolic Play | The ability to use objects, actions, or ideas to represent other objects, actions, or ideas and may include taking on roles. (reference: Symbolic Play (n.d.). Retrieved from https://www.pgpedia.com/s/symbolic-play) |
| Constructive Play | Involves experimenting with objects to build things; learning things that were previously unknown with hands-on manipulations of materials. (reference: Constructive Play (n.d.). Retrieved from https://www.pgpedia.com/c/constructive-play) |
| Games with Rules | Imposes rules that must be followed by everyone that is playing; the logic and order involved forms that the foundations for developing game playing strategy (reference: Games with Rules (n.d.). Retrieved from https://www.pgpedia.com/g/games-rules) |

While Freud, Piaget, and Vygostsky looked at play slightly differently, all three theorists saw play as providing positive outcomes for children.

Mildred Parten (1932) observed two to five year-old children and noted six types of play. Three types were labeled as non-social (unoccupied, solitary, and onlooker) and three types were categorized as social play (parallel, associative, and cooperative). The table below describes each type of play. Younger children engage in non-social play more than those who are older; by age five associative and cooperative play are the most common forms of play (Dyer & Moneta, 2006, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

**Table 11.2: Parten's Classification of Types of Play** (Lumen Learning, n.d., as cited in Paris, Ricardo, Raymond, & Johnson, 2021)

| Category | Description |
| --- | --- |
| Unoccupied Play | Children's behavior seems more random and without a specific goal. This is the least common form of play. |
| Solitary Play | Children play by themselves, do not interact with others, nor are they engaging in similar activities as the children around them. |
| Onlooker Play | Children are observing other children playing. They may comment on the activities and even make suggestions, but will not directly join the play. |
| Parallel Play | Children play alongside each other, using similar toys, but do not directly act with each other |
| Associative Play | Children will interact with each other and share toys but are not working toward a common goal. |
| Cooperative Play | Children are interacting to achieve a common goal. Children may take on different tasks to reach that goal. |

## SOCIAL UNDERSTANDING

As we have seen, children's experience of relationships at home and the peer group contributes to an expanding repertoire of social and emotional skills and also to broadened social understanding. In these relationships, children develop expectations for specific people (leading, for example, to secure or insecure attachments to parents), understanding of how to interact with adults and peers, and developing self-concept based on how others respond to them. These relationships are also significant forums for emotional development.

Remarkably, young children begin developing social understanding very early in life. Before the end of the first year, infants are aware that other people have perceptions, feelings, and other mental states that affect their behavior, and which are different from the child's own mental states. Carefully designed experimental studies show that by late in the preschool years, young children understand that another's beliefs can be mistaken rather than correct, that memories can affect how you feel, and that one's emotions can be hidden from others (Wellman, 2011, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Social understanding grows significantly as children's theory of mind develops.

How do these achievements in social understanding occur? One answer is that young children are remarkably sensitive observers of other people, making connections between their emotional expressions, words, and behavior to derive simple inferences about mental states (e.g., concluding, for example, that what Mommy is

looking at is in their mind) (Gopnik, Meltzoff, & Kuhl, 2001, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). This is especially likely to occur in relationships with people whom the child knows well, consistent with the ideas of attachment theory discussed above.



Figure 11.8: A father speaking to their child. (Image is in the public domain)

Growing language skills give young children words with which to represent these mental states (e.g., "mad," "wants") and talk about them with others. Thus in conversation with their parents about everyday experiences, children learn much about people's mental states from how adults talk about them ("Your sister was sad because they thought Daddy was coming home.") (Thompson, 2006b, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Developing social understanding is based on children's everyday interactions with others and their careful interpretations of what they see and hear. There are also some scientists who believe that infants are biologically prepared to perceive people in a special way, as organisms with an internal mental life, and this facilitates their interpretation of people's behavior with reference to those mental states (Leslie, 1994, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## SOCIAL AND EMOTIONAL COMPETENCE

Social and personality development is built from the social, biological, and representational influences discussed above. These influences result in important developmental outcomes that matter to children, parents, and society: a young adult's capacity to engage in socially constructive actions (helping, caring, sharing with others), to curb hostile or aggressive impulses, to live according to meaningful moral values, to develop a healthy identity and sense of self, and to develop talents and achieve success in using them. These are some of the developmental outcomes that denote social and emotional competence.

These achievements of social and personality development derive from the interaction of many social, biological, and representational influences. Consider, for example, the development of conscience, which is an early foundation for moral development.

Conscience consists of the cognitive, emotional, and social influences that cause young children to create and act consistently with internal standards of conduct (Kochanska, 2002, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). It emerges from young children's experiences with parents, particularly in the development of a mutually responsive relationship that motivates young children to respond constructively to the parents' requests and expectations. Biologically based temperament is involved, as some children are temperamentally more capable of motivated self-regulation (a quality called effortful control) than are others, while some children are more prone to the fear and anxiety that parental disapproval can evoke. The development of conscience is influenced by having a good fit between the child's temperamental qualities and how parents communicate and reinforce behavioral expectations.

Conscience development also expands as young children begin to represent moral values and think of themselves as moral beings. By the end of the preschool years, for example, young children develop a "moral self"

by which they think of themselves as people who want to do the right thing, who feel badly after misbehaving, and who feel uncomfortable when others misbehave. In the development of conscience, young children become more socially and emotionally competent in a manner that provides a foundation for later moral conduct (Thompson, 2012, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).



Figure 11.9: This child might be experiencing a guilty conscience. (Image by George Hodan is in the is licensed under CC0 public domain)

## Indigenous Perspective

Storytelling is used for this.

## Summary

In this chapter we looked at:

- The social developmental continuum for preschoolers.
- Family life, including parenting styles, diverse forms of families and the role of siblings.
- The role of peers.
- The types of play.
- The social understanding of preschoolers.
- Influences on social and emotional competence.

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**CHAPTER 12**

## *Emotional Development in the Preschool Years*

### Chapter Objectives

After this chapter, you should be able to:

- Describe the continuum of development of emotional skills in preschoolers.
- Describe how preschoolers view themselves.
- Summarize Erikson's stage of initiative versus guilt.
- Explain how children develop their understanding of gender.
- Discuss personality and temperament.
- Identify the effects of stress on three- to five-year olds.

## INTRODUCTION

In the preschool years, children's understanding of themselves continues to evolve. Let's examine some of the important interactions in emotional development between the ages of 2.5 and 6 years.

## CONTINUUM OF DEVELOPMENT

The Continuum of Development set out in *Early Learning for Every Child Today: A framework for Ontario early childhood settings (2007)* identifies several root emotional skills that are emerging in children between 2.5 and 6 years of age (Ministry of Education, 2014).

The preschooler is starting to solidify their self-concept, identity and self-esteem. They have improved their ability to recognize and express their emotions appropriately. A typically developing preschooler is developing the ability to regulate their attention, emotions and behavior. These emerging competencies help them persevere when faced with challenges and cope when unsuccessful at a task.

### Interactionism and Views of Self

Early childhood is a time of forming an initial sense of self. A self-concept or idea of who we are, what we are capable of doing, and how we think and feel is a social process that involves taking into consideration how others

view us. So, in order to develop a sense of self, you must have interaction with others. Interactionist theorists, Cooley and Mead offer two interesting explanations of how a sense of self develops.

### *Cooley*

Charles Horton Cooley (1964, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) suggests that our self-concept comes from looking at how others respond to us. This process, known as the looking-glass self involves looking at how others seem to view us and interpreting this as we make judgments about whether we are good or bad, strong or weak, beautiful or ugly, and so on. Of course, we do not always interpret their responses accurately so our self-concept is not simply a mirror reflection of the views of others. After forming an initial self-concept, we may use it as a mental filter screening out those responses that do not seem to fit our ideas of who we are. Some compliments may be negated, for example. The process of the looking-glass self is pronounced when we are preschoolers, or perhaps when we are in a new school or job or are taking on a new role in our personal lives and are trying to gauge our own performances. When we feel more sure of who we are, we focus less on how we appear to others (Leon, n.d.).



Figure 12.1: A child looking at herself wearing glasses in a mirror. (Image is in the public domain)

### *Mead*

Herbert Mead (1967, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) offers an explanation of how we develop a social sense of self by being able to see ourselves through the eyes of others. There are two parts of the self: the "I" which is the part of the self that is spontaneous, creative, innate, and is not concerned with how others view us and the "me" or the social definition of who we are.

When we are born, we are all "I" and act without concern about how others view us. But the socialized self begins when we are able to consider how one important person views us. This initial stage is called "taking the role of the significant other". For example, a child may pull a cat's tail and be told by their mother, "No! Don't do that, that's bad" while receiving a slight slap on the hand. Later, the child may mimic the same behavior toward the self and say aloud, "No, that's bad" while patting his own hand. What has happened? The child is able to see themself through the eyes of the mother. As the child grows and is exposed to many situations and rules of culture, he begins to view the self in the eyes of many others through these cultural norms or rules. This is referred to as

"taking the role of the generalized other" and results in a sense of self with many dimensions. The child comes to have a sense of self as a student, as a friend, as a child, and so on.

## Exaggerated Sense of Self

One of the ways to gain a clearer sense of self is to exaggerate those qualities that are to be incorporated into the self. Preschoolers often like to exaggerate their own qualities or to seek validation as the biggest, smartest, or child who can jump the highest. This exaggeration tends to be replaced by a more realistic sense of self in middle childhood.

## Self-Esteem

Early childhood is a time of forming an initial sense of self. Self-concept is our self-description according to various categories, such as our external and internal qualities. In contrast, self-esteem is an evaluative judgment about who we are. The emergence of cognitive skills in this age group results in improved perceptions of the self, but they tend to focus on external qualities, which are referred to as the categorical self. When researchers ask young children to describe themselves, their descriptions tend to include physical descriptors, preferred activities, and favorite possessions. Thus, the self-description of a 3-year-old might be a 3-year-old girl with red hair, who likes to play with blocks. However, even children as young as three know there is more to themselves than these external characteristics.

Harter and Pike (1984, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) challenged the method of measuring personality with an open-ended question as they felt that language limitations were hindering the ability of young children to express their self-knowledge. They suggested a change to the method of measuring self-concept in young children, whereby researchers provide statements that ask whether something is true of the child (e.g., "I like to boss people around", "I am grumpy most of the time"). They discovered that in early childhood, children answer these statements in an internally consistent manner, especially after the age of four (Goodvin, Meyer, Thompson & Hayes, 2008, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) and often give similar responses to what others (parents and teachers) say about the child (Brown, Mangelsdorf, Agathen, & Ho, 2008; Colwell & Lindsey, 2003, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).



Figure 12.2: Young children tend to feel good about themselves. (Photo by Lukas Rychvalsky on Unsplash)

Young children tend to have a generally positive self-image. This optimism is often the result of a lack of social comparison when making self-evaluations (Ruble, Boggiano, Feldman, & Loeble, 1980, as cited by Paris, Ricardo, Raymond, & Johnson, 2021), and with comparison between what the child once could do to what they can do now (Kemple, 1995). However, this does not mean that preschool children are exempt from negative self-evaluations.

Preschool children with insecure attachments to their caregivers tend to have lower self-esteem at age four (Goodvin et al., 2008, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Maternal negative affect (emotional state) was also found by Goodwin and her colleagues to produce more negative self-evaluations in preschool children.

## *Self-Control*

Self-control is not a single phenomenon but is multi-faceted. It includes response initiation, the ability to not initiate a behavior before you have evaluated all of the information, response inhibition, the ability to stop a behavior that has already begun, and delayed gratification, the ability to hold out for a larger reward by forgoing a smaller immediate reward (Dougherty, Marsh, Mathias, & Swann, 2005). It is in early childhood that we see the start of self-control, a process that takes many years to fully develop. In the famous "Marshmallow Test" (Mischel, Ebbesen, & Zeiss, 1972, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) children aged 3-5 years are confronted with the choice of a small immediate reward (a marshmallow) and a larger delayed reward (more marshmallows). Children who were able to distract themselves from thinking about how much they wanted the delayed reward were more likely to be able to wait for the reward. In follow-up research, Walter Mischel and colleagues over the years have found that the ability to delay gratification at the age of four predicted better academic performance and health later in life (Mischel, et al., 2011, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Self-control is related to executive function;  as executive function improves, children become less impulsive (Traverso, Viterbori, & Usai, 2015, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

Attempts to replicate the findings of the original "Marshmallow Test"  as well as Mischel's follow-up research have been inconsistent. The "Marshmallow Test" has been criticized because of the small sample size (50 children) and because the children all came from wealthy families with well-educated parents.

Dr. Stuart Shanker believes that the "Marshmallow Test" is actually a stress test.  He suggests that a lack of self-control is a symptom of stress. This view is consistent with other critics of the "Marshmallow Test" who believe the results should not be applied to less affluent populations. For example, a child who comes to school hungry because they live in a food-insecure family is experiencing physical stress that would make it very difficult to wait for a food reward instead of taking an immediate food reward. When we reduce stressors in a child's life, their ability to control their own behaviour improves (Shanker's concept of "self-regulation").

### Self-Control and Play

Thanks to the new Centre for Research on Play in Education, Development and Learning (PEDaL), Whitebread, Baker, Gibson and a team of researchers hope to provide evidence on the role played by play in how a child develops, as cited in Paris, Ricardo, Raymond, & Johnson, 2021.

"A strong possibility is that play supports the early development of children's self-control," explains Baker. "These are our abilities to develop awareness of our own thinking processes – they influence how effectively we go about undertaking challenging activities."

A study carried out by Baker with toddlers and young preschoolers found that children with greater self-control solved problems quicker when exploring an unfamiliar set-up requiring scientific reasoning, regardless of their IQ." This sort of

evidence makes us think that giving children the chance to play will make them more successful and creative problem-solvers in the long run."

If playful experiences do facilitate this aspect of development, say the researchers, it could be extremely significant for educational practices because the ability to self-regulate has been shown to be a key predictor of academic performance.

Gibson adds: "Playful behavior is also an important indicator of healthy social and emotional development. In my previous research, I investigated how observing children at play can give us important clues about their well being and can even be useful in the diagnosis of neuro-developmental disorders like autism" (Play's the Thing, by the University of Cambridge is licensed under CC BY 4.0).

## *Moral Development*

Dr. Charles A. Smith, in the paper "Beyond 'I'm Sorry": The Emergence of Conscience in Young Children" defines conscience as "an internal voice that obliges us to act with kindness, respect, and fairness and to make things right as best we can when we do not" (Smith, n.d.). Brain development during the first three years of life enables the preschool-aged child to begin to understand the difference between right and wrong.  Emerging skills of self-control, compassion, sympathy and empathy also contribute to the development of a conscience. Parents, teachers and peers all play a role in helping children learn to care about themselves and others.

Preschoolers are beginning to be able to understand the difference between moral rules and social conventions. Moral rules are non-negotiable; for example, it is wrong to steal or murder. Social conventions are more arbitrary rules that a group has agreed upon; for example, standing in a line to board a bus. It is typical for children to test the limits of social conventions to learn what behavior is allowed and what will not be allowed. How adults respond to testing of limits is important. Dr. Smith believes "Preschool children do not fully understand the responsibility for repairing a wrong. Being forced to say, "I'm sorry" can become a magic incantation of absolution, as though words alone are enough to free them from the consequences of their choices" (Smith, n.d.). Children learn to truly care about others through their own relationships with caring adults.

### Erikson – Initiative Vs Guilt

Psychologist Erik Erikson argues that children in early childhood go through a stage of "initiative vs. guilt". If the child is placed in an environment where they can explore, make decisions, and initiate activities, they have achieved initiative. On the other hand, if the child is put in an environment where initiation is repressed through criticism and control, they will develop a sense of guilt.

Figure 12.3: Children playing in the sand. (Image is in the public domain from Wikimedia Commons)

The trust and autonomy of previous stages develop into a desire to take initiative or to think of ideas and initiative action. Children may want to build a fort with the cushions from the living room couch or open a lemonade stand in the driveway or make a zoo with their stuffed animals and issue tickets to those who want to come. Or they may just want to get themselves ready for bed without any assistance. To reinforce taking initiative, caregivers should offer praise for the child's efforts and avoid being critical of messes or mistakes. Soggy washrags and toothpaste left in the sink pales in comparison to the smiling face of a five-year-old that emerges from the bathroom with clean teeth and pajamas! (Leon, n.d.).

## Gender Identity, Gender Constancy, and Gender Roles

Another important dimension of the self is the sense of self as male or female. Preschool-aged children become increasingly interested in finding out the differences between boys and girls both physically and in terms of what activities are acceptable for each. While 2-year-olds can identify some differences and learn whether they are boys or girls, preschoolers become more interested in what it means to be male or female. This self-identification or gender identity is followed sometime later with gender constancy or the knowledge that gender does not change. Gender roles or the rights and expectations that are associated with being male or female are learned throughout childhood and into adulthood.

### *Freud and the Phallic Stage*

Freud believed that masculinity and femininity were learned during the phallic stage of psychosexual development. According to Freud, during the phallic stage, the child develops an attraction to the opposite-sex parent but after recognizing that they cannot actually be romantically involved with that parent, the child learns to model their own behaviour after the same-sex parent. The child develops their own sense of masculinity or femininity from this resolution. And, according to Freud, a person who does not exhibit gender-appropriate behaviour, such as a woman who competes with men for jobs or a man who lacks self-assurance and dominance, has not successfully completed this stage of development. Consequently, such a person continues to struggle with their own gender identity.

### *Chodorow and Mothering*

Chodorow, a Neo-Freudian, believed that mothering promotes gender stereotypic behaviour. Mothers push their

sons away too soon and direct their attention toward problem-solving and independence. As a result, sons grow up confident in their own abilities but uncomfortable with intimacy. Girls are kept dependent too long and are given unnecessary and even unwelcome assistance from their mothers. Girls learn to underestimate their abilities and lack assertiveness but feel comfortable with intimacy.



Figure 12.4: A boy showing independence and confidence. (Image by Adam Jones is licensed under CC BY-SA 2.0)



Figure 12.5: A girl showing dependence and comfort within a relationship. (Image by Free-Photos on Pixabay)

Both of these models assume that early childhood experiences result in lifelong gender self-concepts. However, current thinking refutes this assumption and sees gender socialization as a process of refinement and modification that continues throughout life.

## Learning through Reinforcement and Modelling

Learning theorists suggest that gender role socialization is a result of the ways in which parents, extended family,

teachers, friends, schools, religious institutions, media and others send messages about what is acceptable or desirable behaviour as males or females. This socialization begins early-in fact, it may even begin the moment a parent learns that a child is on the way. Knowing the sex of the child can conjure up images of the child's behaviour, appearance, and potential on the part of some parents. And this stereotyping may continue to guide perception through life. Consider parents of newborns, shown a 7 pound, 20 inch baby, wrapped in blue (a colour associated with males in Western cultures) describe the child as tough, strong, and angry when crying. Shown the same infant in pink (a colour associated with baby girls in Western cultures), these parents are likely to describe the baby as pretty, delicate, and frustrated when crying. (Maccoby & Jacklin, 1987, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). In Western cultures, female infants may be held more, talked to more frequently and given direct eye contact, while male infants play is often mediated through a toy or activity.

Parents who hold traditional views of male and females gender roles are more likely to give sons tasks that take them outside the house and that have to be performed only on occasion while girls are more likely to be given chores inside the home such as cleaning or cooking that is performed daily. These parents may also encourage sons to think for themselves when they encounter problems while daughters are more likely to be given assistance even when they are working on an answer. This impatience is reflected in teachers waiting less time when asking a female student for an answer than when asking for a reply from a male student (Sadker and Sadker, 1994, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Girls are given the message from teachers that they must try harder and endure in order to succeed while boys' successes are attributed to their intelligence. Cultural gender role stereotypes can also influence which kinds of courses or vocational choices girls and boys are encouraged to make.

Friends discuss what is acceptable for boys and girls and popularity may be based on modelling what is considered ideal behaviour or looks for the sexes. Girls tend to tell one another secrets to validate others as best friends while boys compete for position by emphasizing their knowledge, strength or accomplishments. This focus on accomplishments can even give rise to exaggerating accomplishments in boys, but girls are discouraged from showing off and may learn to minimize their accomplishments as a result.

Gender messages abound in our environment. The Western stereotypes that boys should be strong, forceful, active, dominant, and rational and that girls should be pretty, subordinate, unintelligent, emotional, and gabby are portrayed in children's toys, books, commercials, video games, movies, television shows and music.

Some School Boards in Ontario have developed policies and best practices concerning gender identity and gender expression. For example, the Ottawa-Carleton District School Board's document "Gender Identity and Gender Expression: Guide to Support Our Students" expects its educators to challenge gender stereotypes. Specific actions include:

- Letting all students engage in an activity, not limit the number of boys or girls in a group.

- Encouraging students to take on various roles in a group.

- Avoiding separating boys and girls for activities (e.g. boys go to the gym and girls go to the library) Avoiding giving out awards based on gender (e.g. Most books read by a boy in a month versus most books read by a girl in a month)

- Intervening when children use gender-specific words to make fun of each other (Ottawa Carleton District School Board, 2021). But does this mean that each of us receives and interprets these messages in the same way? Probably not. In addition to being recipients of Western cultural expectations, we are individuals who also modify these roles (Kimmel, 2008, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Based on what young children learn about gender from parents, peers, media and those who they observe and interact with in society, children develop their own conceptions of the attributes associated with maleness or femaleness which is referred to as gender schemas.

Figure 12.6: Store shelves filled with pink and purple colors and girls' toys. (Image by Janet McKnight is licensed under CC BY 2.0)



Figure 12.7: Store shelves filled with primary colours and boys' toys. (Image by Janet McKnight is licensed under CC BY 2.0)

**Indigenous Perspectives**

Gender messages are seen in our ceremonies. Boy's and girl's responsibilities are taught as early as 1 year old during the Walking Out ceremony (this ceremony only pertains to the Anishinabe people). These are not seen as stereotypical but rather what Creator is asking of us. For instance, a boy is taught that he is the protector and the hunter with the responsibility of the fire during ceremony in patriarchal societies. As for the girl, they are responsible for cooking, rearing the children, showing the children what is expected of them and protecting the water in life and in ceremony. Both genders are taught to be strong, active, rational, and respectful of the other gender including Two Spirit people. The girls are not taught that they are subordinate, unintelligent or just a pretty thing. Today it is not uncommon to see young girls taught to hunt, trap or fish or young men to take care of the children. There is more a sense of community and of respect towards all genders. The women are highly respected as the life givers and the men are highly regarded as the hunters and protectors. It is only because of colonization that these concepts started changing. Men started disrespecting and abusing women because of the Western ideologies. Men had lost their way which resulted in the women having to take over the roles and responsibilities of men. This is slowly starting to change due to the return of our cultural and traditional teachings.

Gender identity is not something that is/was important to First Nation communities but rather for the gifts that individual brought to the greater community. The term Two Spirit is a pan Indian term that was created in 1990s by non-Indigenous people. In many teachings, individuals who fall under LGBTQ are regarded as two spirited. Two Spirit individuals are wanting to reclaim the pre-colonial teachings.

"Historically, each nation had their own terms and concepts for Two Spirit people. The roles of the Two Spirit people were teachers, caregivers, medicine people and helpers. They were highly respected for their understanding of both man and woman. They were also seen as having special spiritual gifts." from the following source; Supporting the Sacred Journey. There is also a well-respected knowledge keeper called Albert McLeod who has worked tirelessly for the rights of Two-Spirit.

## *Gender Dysphoria*

A growing body of research is now focused on Gender Dysphoria, or the distress accompanying a mismatch between one's gender identity and biological sex (American Psychiatric Association, 2013, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). The 2018 Survey of Safety in Public and Private Spaces estimated that 0.24% of Canadians aged 15 or older identified as transgender (Statistics Canada, 2020).  Sexual minority people are almost three times more likely to experience violent victimization than heterosexual people (Statistics Canada, 2020). Comments such as stating they prefer the toys, clothing and anatomy of the opposite sex, while rejecting the toys, clothing, and anatomy of their assigned sex are criteria for a diagnosis of Gender Dysphoria in children. Certainly, many young children do not conform to the gender roles modeled by the culture and even push back against assigned roles. However, they do not experience discomfort regarding their gender identity and would not be identified with Gender Dysphoria.

## Personality

Parents often scrutinize their child's preferences, characteristics, and responses for clues of a developing personality. They are quite right to do so because temperament is a foundation for personality growth. But temperament (defined as early-emerging differences in reactivity and self-regulation) is not the whole story. Although temperament is biologically based, it interacts with the influence of experience from the moment of birth (if not before) to shape personality (Rothbart, 2011, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Temperamental dispositions are affected, for example, by the support level of parental care. More generally, personality is shaped by the goodness of fit between the child's temperamental qualities and characteristics of the environment (Chess & Thomas, 1999, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). For example, an adventurous child whose parents regularly take them on weekend hiking and fishing trips would be a good "fit" for their lifestyle, supporting personality growth. Personality is the result, therefore, of the continuous interplay between biological disposition and experience, as is true for many other aspects of social and personality development.

Personality develops from temperament in other ways (Thompson, Winer, & Goodvin, 2010, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). As children mature biologically, temperamental characteristics emerge and change over time. A newborn is not capable of much self-control, but as brain-based capacities for self-control advance, temperamental changes in self-regulation become more apparent. So an infant that cries frequently doesn't necessarily have a grumpy personality. With sufficient parental support and increased sense of security, the child may develop into a content preschooler that is not likely to cry to get her needs met.

Figure 12.8: A girl enjoying nature. (Image by Khanh Steven on Unsplash)

In addition, personality is made up of many other features besides temperament. Children's developing self-concept, their motivations to achieve or to socialize, their values and goals, their coping styles, their sense of responsibility and conscientiousness, and many other qualities are encompassed into personality. These qualities are influenced by biological dispositions, but even more by the child's experiences with others, particularly in close relationships, that guide the growth of individual characteristics. Indeed, personality development begins with the biological foundations of temperament but becomes increasingly elaborated, extended, and refined over time. The newborn that parents observed in wonder upon becomes an adult with a personality of depth and nuance.

## Childhood Stress and Development

Canadian researcher and author, Dr. Stuart Shanker (1952- ), is a leading expert on how stress impacts children and their development. He believes that many developmental and behavioural challenges in children are caused by an overactive stress response. Typical behaviours seen in children under stress include poor attention, emotion regulation, and self-control. These are the "symptoms". Like a fever is a symptom of an infection that won't go away until the infection is cured, the behavioural symptoms of stress can't be alleviated until the cause is addressed – reducing the child's stress.

What is the impact of stress on child development? Children experience different types of stressors. Normal, everyday stress can provide an opportunity for young children to build coping skills and poses little risk to development. Even more long-lasting stressful events such as changing schools or losing a loved one can be managed fairly well. But children who experience toxic stress or who live in extremely stressful situations of abuse over long periods of time can suffer long-lasting effects. The structures in the midbrain or limbic system such as the hippocampus and amygdala can be vulnerable to prolonged stress during early childhood (Middlebrooks and Audage, 2008, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). High levels of the stress hormone cortisol can reduce the size of the hippocampus and affect the child's memory abilities. Stress hormones can also reduce immunity to disease. The brain exposed to long periods of severe stress can develop a low threshold making the child hypersensitive to stress in the future. However, the effects of stress can be minimized if the child has the support of caring adults. Let's take a look at childhood stressors.

## Effects of Domestic Abuse

In 2015, about 10% of Canadians stated that, as a child, they had witnessed domestic violence (Statistics Canada, 2015). There has been an increase in acknowledgment that children exposed to domestic abuse during their upbringing will suffer in their developmental and psychological welfare. Because of the awareness of domestic violence that some children have to face, it also generally impacts how the child develops emotionally, socially, behaviourally as well as cognitively. Some emotional and behavioral problems that can result due to domestic violence include increased aggressiveness, anxiety, and changes in how a child socializes with friends, family, and authorities. Bruises, broken bones, head injuries, lacerations, and internal bleeding are some of the acute effects of a domestic violence incident that require medical attention and hospitalization.

## Child Maltreatment

Child abuse is the physical, sexual, or emotional mistreatment or neglect of a child or children. Most Canadian jurisdictions have added exposure to family violence as a distinct form of maltreatment in addition to physical abuse, sexual abuse, neglect and emotional harm. Accurate statistics about the rate of incidence of child maltreatment are difficult to obtain because of under-reporting.

### Child Maltreatment in Canada

"Findings from an Ontario community-based survey indicate that maltreatment is a common experience for children living in that province. A history of experiencing physical abuse during childhood was reported by 31.2% of males and 21.1% of females, with similar proportions of males (10.7%) and females (9.2%) reporting a history of severe physical abuse. More females (12.8%) than males (4.3%) reported experiences of childhood sexual abuse. Overall, 33% of males and 27% of females reported that they had experienced one or more incidents of physical and/or sexual abuse during their childhood.

Given that this Ontario survey did not ask questions about neglect, emotional harm or exposure to family violence, the overall message it suggests is that at least one in three individuals experiences some form of maltreatment over the course of their childhood. It seems safe to say that if all five types of child maltreatment were taken into consideration, this proportion would be much higher" (Government of Canada, 2012).

## Physical Abuse

Physical abuse occurs when a person in a position of trust or authority purposefully injures or threatens to injure a child or youth. Examples of physical abuse include but are not limited to: shaking, hitting, excessively pinching, slapping or tripping a child, withholding sleep, food or medication, burning or scalding.

The distinction between physical abuse and discipline is not well understood. In Canada, Section 43 of the Criminal Code of Canada allows the use of some physical force by a parent (or person standing in for a parent) if the purpose is to discipline a child. However, the force must be "reasonable" under the circumstances. In 2004, the

Supreme Court of Canada narrowed the definition of "reasonable" to mean " transitory and trifling" (Government of Canada, 2021). Any action that leaves a mark on a child, such as a bruise, would not be considered reasonable. The Supreme Court also issued the following guidelines:

- Physical punishment cannot be used on children younger than 2 years or older than 12 years.
- Objects such as belts or rulers cannot be used on a child.
- A child is never to be hit on the face or head.
- Any use of force cannot be degrading.
- Physical punishment cannot be used on a child who is not able to understand the situation because of a developmental delay (Government of Canada, 2021).

Spanking as a form of physical punishment could be considered legal under the Criminal Code of Canada if the Supreme Court's guidelines are followed. However, this does not prevent provincial/territorial/Indigenous child protection agencies from considering spanking as grounds for protection.

### Sexual Abuse

Child sexual abuse is a form of child abuse in which an adult or older adolescent abuses a child for sexual stimulation. Effects of child sexual abuse include guilt and self-blame, flashbacks, nightmares, insomnia, and fear of things associated with the abuse. In 2014, Statistics Canada conducted a survey of 33,000 individuals over the age of 15. 8% of respondents reported childhood sexual abuse. This would correspond to approximately 2.4 million Canadians. This is probably an under-representation of the true number, as it only captured respondents willing to self-disclose to an unknown person on a phone (Canadian Centre for Child Protection, 2018).

### Emotional Abuse

Out of all the possible forms of abuse, emotional abuse is the hardest to define. It could include name-calling, ridicule, degradation, destruction of personal belongings, torture or killing of a pet, excessive criticism, inappropriate or excessive demands, withholding communication, and routine labeling or humiliation.

### Neglect

Neglect is a passive form of abuse in which a perpetrator is responsible to provide care for a victim who is unable to care for themselves but fails to provide adequate care. Neglect may include the failure to provide sufficient supervision, nourishment, or medical care, or the failure to fulfill other needs for which the victim is helpless to provide for themselves. Neglect can have many long-term side effects, such as physical injuries, low self-esteem, attention disorders, violent behaviour, and even death.

### Child Protection Legislation in Canada

In Canada, child protection falls under the jurisdiction of the provinces, territories and Indigenous welfare agencies. Legislation varies across these different jurisdictions.

In Ontario, *The Child Youth and Family Services Act*, offers protection to children under the age of 18. In relationship to types of abuse, under this legislation a child is in need of protection when there is:

- Physical harm or a likely risk of physical harm

- A pattern of neglect

- Sexual abuse or exploitation or a likely risk of sexual abuse or exploitation

- Emotional harm or a likely risk of emotional harm

- Failure to agree to treatment to relieve physical harm, sexual abuse or neglect (Province of Ontario, 2017).

In Canada, some Indigenous communities manage their own child welfare services, ensuring culturally appropriate programs and services. However, not all communities, especially un-ceded communities or those not recognized by the government, fall under provincial child protection legislation. Some communities, including the Metis people, are still fighting to be included in child protection legislation. In Ontario, there are 11 Indigenous children's aid societies. The importance of self-governance in relationship to child welfare was a key finding of the Truth and Reconciliation Commission of Canada, 2015. (National Collaborating Centre for Aboriginal Health, 2017).

## Summary

In this chapter we looked at:

- The emotional developmental continuum for preschoolers.

- The development of self-concept and self-esteem.

- Erikson's psychosocial stage of initiative versus guilt.

- Gender identity, gender constancy, gender roles, and gender dysphoria.

- Personality development

- The effects of stress on children, including maltreatment.

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**CHAPTER 13**

# *Communication, Language and Literacy Development in the Preschool Years*

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Chapter Objectives

After this chapter, you should be able to:

- Discuss communication language and literacy development that takes place during the preschool years
- explain theories of language development

## INTRODUCTION

A child's vocabulary expands between the ages of 2 to 6 from about 200 words to over 10,000 words through a process called fast-mapping. Words are easily learned by making connections between new words and concepts already known. The parts of speech that are learned depend on the language and what is emphasized. Children speaking verb-friendly languages such as Chinese and Japanese, tend to learn verbs more readily. But those learning less verb-friendly languages such as English, seem to need assistance in grammar to master the use of verbs (Imai, et al, 2008, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).



Figure 1: A woman instructing a girl on vocabulary. (Image by the U.S. Department of the Interior is in the public domain)

## LITERAL MEANINGS

Children can repeat words and phrases after having heard them only once or twice. But they do not always understand the meaning of the words or phrases. This is especially true of expressions or figures of speech that are taken literally. For example, a supply educator explains that he is working with them because their regular educator has 'lost their voice'. The children, with great concern, want to know where they lost it and if they will find it again. Or a classroom full of preschoolers hears the teacher say "Wow! That was a piece of cake!" The children begin asking "Cake? Who took it? Are we having cake? "

## OVERREGULARIZATION

Children learn rules of grammar as they learn a language but may apply these rules inappropriately at first. For instance, a child learns to add "ed" to the end of a word to indicate past tense. Then form a sentence such as "I goed there. I doed that." This is typical at ages 2 and 3. They will soon learn new words such as "went" and "did" to be used in those situations.

## THE IMPACT OF TRAINING

Remember Vygotsky and the zone of proximal development? Children can be assisted in learning language by others who listen attentively, model more accurate pronunciations and encourage elaboration. The child exclaims, "I goed there!" and the adult responds, "You went there? Say, 'I went there.' Where did you go?" Children may be ripe for language as Chomsky suggests, but active participation in helping them learn is important for language development as well. The process of scaffolding is one in which the adult (or more skilled peer) provides needed assistance to the child as a new skill is learned.

## COMMUNICATING WITH OTHERS

In the preschool years children become more skilled at communicating with others. They become increasingly aware of the conventions of effective conversations. Research shows that four year olds intentionally adjust their communication to match the listener and the context. (Shatz & Gelman 1983, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). In the study four year olds were asked to explain how a toy worked. The study showed that when explaining how the toy worked to adults, the children used longer sentences and talked more overall than compared to when they were explaining how the toy worked to two year olds. Their explanations to toddlers included simpler grammar and more attention-getting words such as see, look, watch. Children are becoming increasingly aware of the responsibilities of the speaker to pay attention to the listener and if the listener appears to not understand that they as the speaker should address this (Shwe & Markman, 1997, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). This might mean more than simply repeating what they said and they may clarify or provide an example.

Preschoolers also become better listeners and can discern if a message makes sense and who is better informed about a particular topic (Robinson, Champion & Mitchell, 1999, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

According to the Ministry of Education (2014), via the Continuum of Development, communication, language and literacy development continues to takes place during the preschool/kindergarten stage of development. The skills demonstrated by infants and toddlers continue to develop as children become skilled communicators using verbal

and non-verbal styles of communication to converse with peers and adults. Their expanding vocabulary supports them to describe and make meaning of their experiences and the world around them. They notice environmental print, engage in literacy and become increasingly aware of its power as a human activity. Their phonological awareness increases as they manipulate words, recognize letters and begin to write them.

## LANGUAGE MILESTONES

The prior aspects of language development in early childhood can also be summarized into the progression of milestones children typically experience from ages 3 to 5. Here is a table of those.

**Table 13.1: Language Milestones**

| TYPICAL AGE | TYPICAL SKILL |
| --- | --- |
| 3 years | • Follows instructions with 2 or 3 steps<br>• Can name most familiar things<br>• Understands words like "in," "on," and "under"<br>• Says first name, age, and sex<br>• Names a friend<br>• Says words like "I," "me," "we," and "you" and some plurals (cars, dogs, cats)<br>• Talks well enough for strangers to understand most of the time<br>• Carries on a conversation using 2 to 3 sentences |
| 4 years | • Knows some basic rules of grammar, such as correctly using "he" and "she"<br>• Sings a song or says a poem from memory such as the "Itsy Bitsy Spider" or the "Wheels on the Bus"<br>• Tells stories<br>• Can say first and last name |
| 5 years | • Speaks very clearly<br>• Tells a simple story using full sentences<br>• Uses future tense; for example, "Grandma will be here."<br>• Says name and address |

Table 13.1: Language Milestones (Developmental Milestones by the CDC is in the public domain)

### Indigenous Perspectives

Please read the following article Fostering Literacy Success for First Nations, Metis and Inuit by Dr. Pamela Rose Toulouse. Shares that Indigenous learners should not be regarded as ESL but as bilingual.

**Theories of Language Development**

Humans, especially children, have an amazing ability to learn language. Within the first year of life, children will have learned many of the necessary concepts to have functional language, although it will still take years for their capabilities to develop fully. Here is a recap of the theorists and theories that have been proposed to explain the development of language, and related brain structures, in children.

**Skinner: Operant Conditioning**

B.F. Skinner believed that children learn language through **operant conditioning**; in other words, children receive "rewards" for using language in a functional manner. For example, a child learns to say the word "drink"

when they are thirsty; they receive something to drink, which reinforces the use of the word for getting a drink, and thus they will continue to do so. This follows the four-term contingency that Skinner believed was the basis of language development—motivating operations, discriminative stimuli, response, and reinforcing stimuli. Skinner also suggested that children learn language through imitation of others, prompting, and shaping.

**Chomsky: Language Acquisition Device**

Noam Chomsky's work discusses the biological basis for language and claims that children have innate abilities to learn language. Chomsky terms this innate ability the "language acquisition device." He believes children instinctively learn language without any formal instruction. He also believes children have a natural need to use language, and that in the absence of formal language children will develop a system of communication to meet their needs. He has observed that all children make the same type of language errors, regardless of the language they are taught. Chomsky also believes in the existence of a "universal grammar," which posits that there are certain grammatical rules all human languages share. However, the research does not identify areas of the brain or a genetic basis that enables humans' innate ability for language.

**Piaget: Assimilation and Accommodation**

Jean Piaget's theory of language development suggests that children use both assimilation and accommodation to learn language. **Assimilation** is the process of changing one's environment to place information into an already-existing schema (or idea). **Accommodation** is the process of changing one's schema to adapt to the new environment. Piaget believed children need to first develop mentally before language acquisition can occur. According to Piaget, children first create mental structures within the mind (schemas) and from these schemas, language development happens.

**Vygotsky: Zone of Proximal Development**

Lev Vygotsky's theory of language development focused on social learning and **the zone of proximal development (ZPD).** The ZPD is a level of development obtained when children engage in social interactions with others; it is the distance between a child's *potential* to learn and the *actual learning* that takes place. Vygotsky's theory also demonstrated that Piaget underestimated the importance of social interactions in the development of language.

## Summary

In this chapter we looked at:

- ◦ Preschooler's communication language and literacy development
- ◦ theories of language development

References

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**CHAPTER 14**

*Physical Development in Middle Childhood*

After this chapter, you should be able to:

- Describe the patterns of physical growth
- Summarize nutrition needs
- Explain the causes of obesity and the negative consequences of excessive weight gain
- Explain challenges to physical health including, vision, hearing, oral health, diabetes, asthma and childhood stress

## INTRODUCTION

Children in middle childhood go through tremendous changes in the growth and development of their brain. During this period of development children's bodies are not only growing, but they are becoming more coordinated and physically capable. Children are more mindful of their greater abilities in school and are becoming more responsible for their health and diet.

## BRAIN DEVELOPMENT

The brain reaches its adult size at about age 7. Then between 10 and 12 years of age, the frontal lobes become more developed and improvements in logic, planning, and memory are evident (van der Molen & Molenaar, 1994, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). The school-aged child is better able to plan and coordinate activity using both the left and right hemispheres of the brain, which control the development of emotions, physical abilities, and intellectual capabilities. The attention span also improves as the prefrontal cortex matures. The myelin also continues to develop and the child's reaction time improves as well. Myelination improvement is one factor responsible for these growths.

From age 6 to 12, the nerve cells in the association areas of the brain, that is those areas where sensory, motor, and intellectual functioning connect, become almost completely myelinated (Johnson, 2005, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). This myelination contributes to increases in information processing speed and the child's reaction time. The hippocampus, which is responsible for transferring information from the short-

term to long-term memory, also shows increases in myelination resulting in improvements in memory functioning (Rolls, 2000, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).
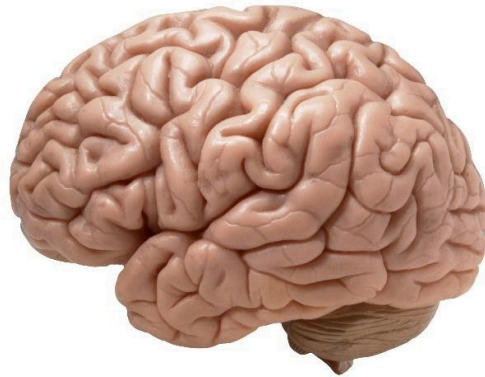


Figure 14.1: The human brain. (Image by DJ is licensed under CC BY-SA 2.0)

## PHYSICAL GROWTH

Middle childhood spans the years between early childhood and adolescence, children are approximately 6 to 12 years old.  While growth spurts can happen, in general physical growth rates are generally slow and steady during these years.  (Spreen, Riser, & Edgell, 1995, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Typically, a child will gain about 5-7 pounds a year and grow about 2 inches per year. They also tend to slim down and gain muscle strength. As bones lengthen and broaden and muscles strengthen, many children want to engage in strenuous physical activity and can participate for longer periods of time. In addition, the rate of growth for the extremities is faster than for the trunk, which results in more adult-like proportions. Long-bone growth stretches muscles and ligaments, which results in many children experiencing growing pains, at night, in particular.
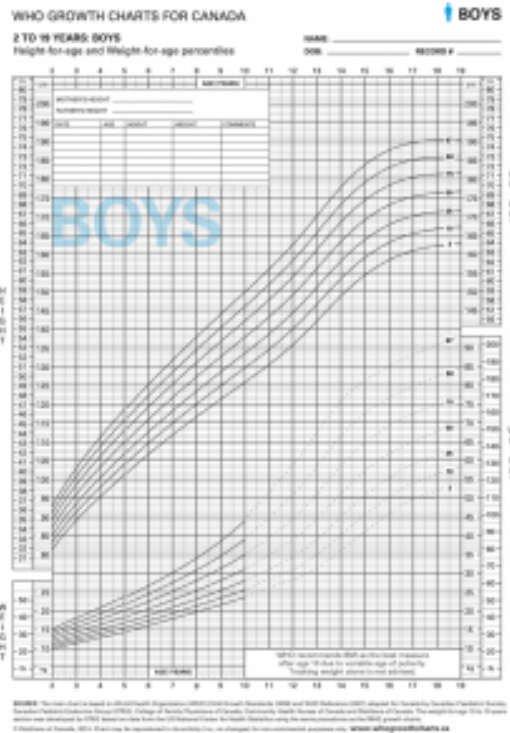
Figure 14.2: Dieticians of Canada (2014a)
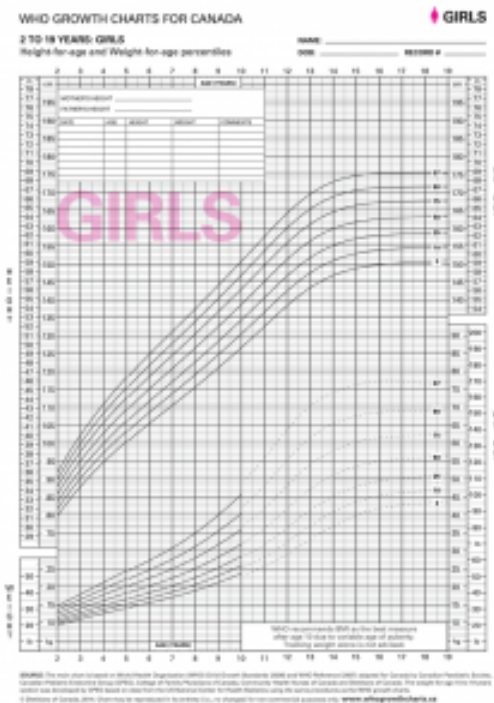


Figure 14.3: Dieticians of Canada (2014b).

As you can see from the above charts, there is a similarity in the average heights and weights of boys and girls during this developmental stage. For instance, at the age of 6 boys in the 50th percentile weigh 47 pounds and are 45.5 inches tall and girls measure in at 46 pounds and 45 inches tall. At the age of 9, boys in the 50th percentile weigh 52 pounds and are 62 inches tall and girls measure at the same. It also should be noted here that the World Health Organization (WHO) recommends Body Mass Index (BMI) as the best measure of weight after age 10, due

to variable age of puberty and tracking weight alone is not advised (Dieticians of Canada, 2014b). According to the Childhood Obesity Foundation (n.d.), BMI is an indirect indicator of body fat. It is a measurement based on height and weight that tells if a child, or adult, is in a healthy range compared to their peers. It should be noted that BMI may not be an accurate indicator of body fat if your child is very muscular. There are lots of online tools available to calculate BMI in children. Check out these Smart BMI Calculators.

Beyond height and weight, a child's physical growth can be seen in other ways. Children between ages 6 and 12, show significant improvement in their abilities to perform physical motor skills. This development growth allows children to gain greater control over the movement of their bodies, mastering many gross motor skills that were beyond that of the younger child. The Continuum of Development shares that during these middle childhood years, the development of gross motor skills continues to focus on increasing coordination, speed, and endurance (Ontario Ministry of Education, 2014).

Specifically, the gross motor skills that we see strengthen most, in children aged 6-12, are:

- Running: increasing control, speed and coordination;
- Jumping: jumping vertically increases in height, standing broad jump increases in length;
- Throwing: throwing speed, distance and accuracy improve;
- Catching: catching small balls over greater distances;
- Kicking: kicking speed and accuracy improve (Ontario Ministry of Education, 2014).

## NUTRITIONAL NEEDS

A number of factors can influence children's eating habits and attitudes toward food. Family environment, societal trends, taste preferences, and messages in the media all impact the emotions that children develop in relation to their diet. Television commercials can entice children to consume sugary products, fatty fast foods, excess calories, refined ingredients, and sodium. Therefore, it is critical that caregivers support children with making healthy nutritional choices by reinforcing good eating habits and by introducing new foods into the diet, while remaining mindful of a child's preferences. Caregivers should also serve as role models for children, who will often mimic their behaviour and eating habits. Let's think for a moment about what our parents and grandparents used to eat? What are some of the differences that you may have experienced as a child?

One hundred years ago, as families sat down to dinner, they might have eaten boiled potatoes or corn, leafy vegetables such as cabbage or collards, fresh-baked bread, and, if they were fortunate, a small amount of beef or chicken. Young and old alike benefitted from a sound diet that packed a real nutritional punch. Times have changed. Many families today fill their dinner plates with fatty foods, such as French Fries cooked in vegetable oil, a hamburger that contains several ounces of ground beef, and a white-bread bun, with a single piece of lettuce and a slice or two of tomato as the only vegetables served with the meal.

Figure 14.4: A modern meal. ( Image is licensed under CCO)

Our diet has changed drastically as processed foods, which did not exist a century ago, and animal-based foods now account for a large percentage of our calories. Not only has what we eat changed, but the amount of it that we consume has greatly increased as well, as plates and portion sizes have grown much larger. All of these choices impact our health, with short- and long-term consequences as we age. Possible effects in the short-term include excess weight gain and constipation. The possible long-term effects, primarily related to obesity, include the risk of cardiovascular disease, diabetes, hypertension, as well as other health and emotional problems for children.

During middle childhood, a healthy diet facilitates physical, social/emotional and cognitive development and helps to maintain health and wellness. School-aged children experience steady, consistent growth, but at a slower rate than they did in early childhood. This slowed growth rate can have a lasting impact if nutritional, caloric, and activity levels aren't adjusted in middle childhood which can lead to excessive weight gain early in life and can lead to obesity into adolescence and adulthood. Making sure that children have proper nutrients will allow for optimal growth and development.


Figure 14.5: Government of Canada (2020)

The Government of Canada (2020), via their Canada Food Guide, recommends that individuals over the age of six:

- Eat plenty of vegetables and fruits, whole grain foods and protein foods. Choose protein foods that come from plants more often.

- Choose foods with healthy fats instead of saturated fat

- Limit highly processed foods. If you choose these foods, eat them less often and in small amounts.

- Prepare meals and snacks using ingredients that have little to no added sodium, sugars or saturated fat

- Choose healthier menu options when eating out

- Make water your drink of choice

- Replace sugary drinks with water

- Use food labels

- Be aware of food marketing

Caregivers should teach children that healthy eating is more than the foods you eat. The Government of Canada (2020) recommends that we:

- Be mindful of eating habits (take time to eat; notice when full/hungry),

- Cook more often (plan what to eat; involve others in the preparation).

- Enjoy food

- Eat meals with others

One way to encourage children to eat healthy foods is to make meal and snack time fun and interesting. Parents should include children in food planning and preparation, for example selecting items while grocery shopping or helping to prepare part of a meal, such as making a salad. At this time, parents can also educate children about kitchen safety. It might be helpful to cut sandwiches, meats, or pancakes into small or interesting shapes. In addition, parents should offer nutritious desserts, such as fresh fruits, instead of calorie-laden cookies, cakes, salty snacks, and ice cream. Studies show that children who eat family meals on a frequent basis consume more nutritious foods.

## ENERGY

Children's energy needs vary, depending on their growth and level of physical activity. Energy requirements also vary according to gender. Girls require 1,200 to 1,400 calories a day from age 2 to 8 and 1,400-1,800 for age 9 to 13. Boys also need 1,200 to 1,400 calories daily from age 4 to 8 but their daily caloric needs go up to 1,600-2,000 from age 9 to 13. This range represents individual differences, including how active the child is.
Recommended intakes of macronutrients (protein, carbohydrates, and fats) and most micronutrients (vitamins and minerals) are higher relative to body size, compared with nutrient needs during adulthood. Therefore, children should be provided nutrient-dense food at meal- and snack-time. However, it is important not to overfeed children, as this can lead to childhood obesity, which is discussed in the next section.

## CHILDREN AND VEGETARIANISM

Some parents and caregivers decide to raise their children as vegetarians for health, cultural, or other reasons. School aged children may make the choice to pursue vegetarianism on their own, due to concerns about animals or the environment. No matter the reason, with good planning, a vegetarian diet can be a healthy choice that meets a growing child's nutritional needs.

## TYPE OF VEGETARIAN DIETS

There are several types of vegetarians, each with certain restrictions in terms of diet:
**Ovo-vegetarians-** eat eggs, but do not eat any other animal products.
**Lacto-ovo-vegetarians-** eat eggs and dairy products, but do not eat any meat.
**Lacto-vegetarians-** eat dairy products, but do not eat any other animal products.
**Vegans-** eat food only from plant sources, no animal products at all.

Figure 14.6: A school lunch (Image from Pixabay)

## CHILDREN AND MALNUTRITION

Many may not know that malnutrition is a problem that many children face, in both developing nations and the developed world. Even with the wealth of food in North America, many children grow up malnourished, or even hungry. Household food insecurity is inadequate or insecure access to food because of income or finances. It is a serious public health issue in Canada that negatively impacts physical, mental, and social health, and costs our healthcare system considerably (Dieticians of Canada, 2021). In 2017-2018, one in eight Canadian households was food insecure, amounting to 4.4 million people, including 1.2 million children (PROOF, 2021).
Growing up in a food-insecure environment can have significant consequences on a child's healthy growth and development and well-being. According to Children First Canada (2020), food insecurity can affect children in the following ways:

- **Obesity:** Most caregivers ensure that their children are fed as much as possible, despite any financial setbacks, however these same parents may not have the money or time to prepare nutritious meals. This can lead to families eating a lot of cheap foods with low nutrition density.

- **Nutritional and vitamin deficiencies:** Children eating foods that are not nutrient-dense can end up with various nutritional deficiencies leading to fatigue or even illness. Anemia, stunted growth or bone deformities and abnormalities may occur. Additionally, children who are nutrient-deficient will also be moodier and face more challenges maintaining emotional stability, which hinders their ability to mature in this area.

- **School challenges:** Children who don't get sufficient nutrition are going to be fatigued throughout the

day and this can impact their educational performance. They may end up with poor grades, even if they've done all of the required work and studying. They may have a harder time making friends and forming bonds, stunting their emotional and social development.

- **Parental stress:** Adults who are dealing with food and financial insecurity are likely to be stressed, depressed or otherwise unwell. Over-stressed caregivers aren't able to give as much time and attention to their children and even with the best intentions, they may end up emotionally blocked off. When the parents are stressed, so are the children.

- **Generational poverty:** Children who grow up in food-insecure homes can easily turn into adults who lead food-insecure homes. While many people aspire to do better than the households that they came from, it's harder to move up in life when you have fewer resources available to you.

**Indigenous Perspectives**

The following article First Nations Nutrition discusses the risk of malnourishment and chronic diseases in First Nations children.

## BEING OVERWEIGHT AND OBESITY IN CHILDREN

Excess weight and obesity in children are associated with a variety of medical conditions including high blood pressure, insulin resistance, inflammation, depression, and lower academic achievement (Lu, 2016, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Being overweight has also been linked to impaired brain functioning, which includes deficits in executive functioning, working memory, mental flexibility, and decision making (Liang, Matheson, Kaye, & Boutelle, 2014, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Children who ate more saturated fats performed worse on relational memory tasks, while eating a diet high in omega-3 fatty acids promoted relational memory skills (Davidson, 2014, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Using animal studies, Davidson et al. (2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) found that large amounts of processed sugars and saturated fat weakened the blood-brain barrier, especially in the hippocampus. This can make the brain more vulnerable to harmful substances that can impair its functioning. Another important executive functioning skill is controlling impulses and delaying gratification. Children who are overweight show less inhibitory control than normal-weight children, which may make it more difficult for them to avoid unhealthy foods (Lu, 2016, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Overall, being overweight as a child increases the risk for cognitive decline as one ages.

According to the Childhood Obesity Foundation (2019), it estimated that over 150 million children in the world are obese and this number is rising. In Canada specifically, the incidence of childhood obesity has nearly tripled in the last 30 years (Childhood Obesity Foundation, 2019), and one in four Canadian children are overweight or obese (Public Health Agency of Canada, 2016). Unfortunately, most adolescents do not outgrow this problem and in fact, many continue to gain excess weight. If current trends continue, by 2040 up to 70% of adults aged 40 years will be either overweight or obese worldwide (Childhood Obesity Foundation, 2019).

Obesity in childhood is associated with a wide range of serious health complications such as fatty liver disease and type 2 diabetes. Obese children run the risk of suffering orthopedic problems such as knee injuries, and they have an increased risk of developing heart disease, type 2 diabetes, 13 different cancers, liver disease, hypertension and stroke in adulthood (Childhood Obesity Foundation, 2019). In addition, it is hard for a child who is obese to become a non-obese adult. Thus, this is a public health crisis that we need to tackle.

According to the Government of Canada (2019), the following are things that caregivers can do to support children at remaining in a healthy weight:
**Eat healthy:**

- Following the food guide,

- Set a good example by being a role model for healthy eating. Children are more likely to try new foods if their caregivers eat them too.

- Eat meals together as often as possible and make the food the focus. Turn off the TV and put away electronic devices during mealtime. Children often eat better without these distractions.

- Involve children in the planning and preparing of meals and snacks.

**Be physically active:**

- According to the Canadian Society for Exercise Physiology (CSEP), children and teenagers should participate in at least 60 minutes per day of moderate to vigorous physical activity involving a variety of aerobic activities. Vigorous physical activities, and muscle and bone strengthening activities should each be incorporated at least 3 days per week; Several hours of a variety of structured and unstructured light physical activities should also be incorporated into each child's day (CSEP, 2021).

- Set a good example by being a role model for participating in healthy physical activity. Add physical activity to your daily routine and encourage children to join you.

- Limit the amount of time children spend on sedentary activities like watching television, playing video games, and surfing the web.

- Be aware of the opportunities your community offers to help your family stay healthy. Are there bike paths nearby? What community programs are available throughout the year?

Interestingly, behavioural interventions, including training children to overcome impulsive behaviour, are being researched to help overweight children (Lu, 2016, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Practicing inhibition has been shown to strengthen the ability to resist unhealthy foods. Caregivers can help their overweight/obese children the best when they are warm and supportive without using shame or guilt, helping them make correct food choices and praising their efforts (Liang, et al., 2014, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Increasing a child's activity level is most helpful in combatting obesity and caregivers should be cautioned against emphasizing that diet alone will fix the problem. Dieting is not really the answer. When you diet, your basal metabolic rate tends to decrease thereby making the body burn even fewer calories in order to maintain the weight and often when one focuses on diet, it can lead to the development of an obsession about dieting. Obsessing about dieting often leads to the development of an eating disorder. Eating disorders are common in Canadian society, with up to 5% of young women having experienced an eating disorder before reaching adulthood. While anorexia nervosa typically has its onset in mid-adolescence, it can also occur in younger children (Findlay, Pinzon, Taddeo & Katzman, 2010).

## BEING OVERWEIGHT CAN BE A LIFELONG STRUGGLE

A growing concern regarding obesity is the lack of recognition from parents/caregivers that children are overweight or obese. Katz (2015) referred to this as "oblivobesity". Black et al. (2015, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) found that parents in the United Kingdom (UK) only recognized their children as obese when they were above the 99.7thpercentile while the official cut-off for obesity is at the 85thpercentile. Oude Luttikhuis, Stolk, and Sauer (2010, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) surveyed 439 parents and found that 75% of parents of overweight children said the child had a normal weight and 50% of parents of obese children said the child had a normal weight. For these parents, overweight was considered normal and obesity

was considered normal or a little heavy. Doolen, Alpert, and Miller (2009, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) reported on several studies from the United Kingdom, Australia, Italy, and the United States, and in all locations, parents were more likely to misperceive their children's weight. Black, Park, and Gregson (2015, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) concluded that as the average weight of children rises, what parents consider normal also rises. If parents cannot identify if their children are overweight, they will not be able to intervene and assist their children with proper weight management.

**Indigenous Perspectives**

   Indigenous people's diets have been substantially changed by the coming of settlers. They brought the flour, salt, sugar, milk and lard. Those "5 white gifts" saved their lives but impacted their livelihood and their health. When the government put Indigenous people on reservations, they had to sign themselves out to go hunting, fishing and trapping. On some reservations, they were not allowed to go harvest. Some people starved and others learned to cook with them. The recipe for bannock or scone came from the Scottish people. These "staples" gave the Indigenous people diabetes and brought other sicknesses. The following link explains The White Gifts.  Many remote communities don't have fresh produce, food is very expensive, the produce that does make its way there is brown or discoloured; therefore, it is simpler and cheaper to eat foods that are not good for them. i.e. pasta, fried bread or bannock, processed foods, pop, chips, chocolate bars, etc). Obesity and diabetes are very prominent in these communities. As a result, diabetes initiatives have been put in place to try to curve the onset of diabetes, heart attacks and, strokes

## COMMON CHALLENGES WITH PHYSICAL HEALTH

### Vision and Hearing
The most common vision problem in middle childhood is being nearsighted, otherwise known as Myopic. 25% of children will be diagnosed by the end of middle childhood. Being nearsighted can be corrected by wearing glasses with corrective lenses.



Figure 14.7:  A child receiving an eye exam. (Image is in the public domain)

Children may have many ear infections in early childhood, but it's not as common within the 6-12 year age range. Numerous ear infections during middle childhood may lead to headaches and migraines, which may result in hearing loss.

### Oral Health
Children in middle childhood will start or continue to lose teeth.  They experience the loss of deciduous, or "baby," teeth and the arrival of permanent teeth, which typically begins at age six or seven, although it can start as early

as the age of 4. It is important for children to continue seeing a dentist twice a year to be sure that their teeth are healthy.

The foods and nutrients that children consume are also important for dental health. Offer healthy foods and snacks to children and when children do eat sugary or sticky foods, they should brush their teeth afterward.
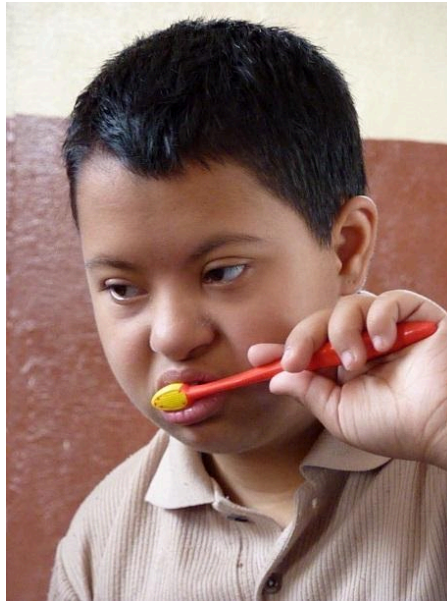


Figure 14.8: A child brushing their teeth. (Image by Latrobebohs is licensed under CC BY-SA 3.0)

Children should floss daily and brush their teeth at least twice daily: in the morning, at bedtime, and preferably after meals. Parents or caregivers are encouraged to supervise brushing until your child is 7 or 8 years old to avoid tooth decay.

The best defence against tooth decay is flossing, brushing and adding fluoride; a mineral found in most tap water. If your water doesn't have fluoride, ask a dentist about fluoride drops, gel or varnish. Also ask your child's dentist about sealants—a simple, pain-free way to prevent tooth decay. These thin plastic coatings are painted on the chewing surfaces of permanent back teeth. They quickly harden to form a protective shield against germs and food. If a small cavity is accidentally covered by a sealant, the decay won't spread because germs trapped inside are sealed off from their food supply.

Children's dental health needs continuous monitoring as children lose teeth and new teeth come in. Many children have some malocclusion (when the way upper teeth aren't correctly positioned slightly over the lower teeth, including under- and overbites) or malposition of their teeth, which can affect their ability to chew food, floss, and brush properly. Dentists may recommend that it's time to see an orthodontist to maintain proper dental health. Dental health is exceedingly important as children grow more independent by making food choices and as they start to take over flossing and brushing. Parents can ease this transition by promoting healthy eating and proper dental hygiene.

In Ontario, children under the age of 17 years may be eligible for free dental care through the governments **Healthy Smiles** for low-income families (Government of Ontario, 2021).

### Diabetes in Childhood

Until recently diabetes in children and adolescents was thought of almost exclusively as type 1, but that thinking has evolved. Type 1 diabetes is the most common form of diabetes in children and is the result of a lack or

production of insulin due to an overactive immune system. Type 2 diabetes used to be referred to as adult-onset diabetes as it was not common during childhood. But with increasing rates of overweight and obesity in children and adolescents, more Type 2 diagnoses are happening before adulthood. It is also important to note that Type 2 disproportionately affects minority youth.



Figure 14.9: The finger-prick blood sugar test for diabetes. (Image by the U.S. Army is in the public domain)

**Asthma**

Childhood asthma that is unmanaged may make it difficult for children to develop to their fullest potential. Asthma is a chronic lung disease that inflames and narrows the airways. Asthma causes recurring periods of wheezing (a whistling sound when you breathe), chest tightness, shortness of breath, and coughing. The coughing often occurs at night or early in the morning. Asthma affects people of all ages, but it most often starts during childhood. According to Asthma Canada (n.d.), over 850,000 children under the age of 14 in Canada are affected by asthma. Asthma is the leading cause of school absences.

To understand asthma, it helps to know how the airways work. The airways are tubes that carry air into and out of your lungs. People who have asthma have inflamed airways. The inflammation makes the airways swollen and very sensitive. The airways tend to react strongly to certain inhaled substances. When the airways react, the muscles around them tighten. This narrows the airways, causing less air to flow into the lungs. The swelling also can worsen, making the airways even narrower. Cells in the airways might make more mucus than usual. Mucus is a sticky, thick liquid that can further narrow the airways. This chain reaction can result in asthma symptoms. Symptoms can happen each time the airways are inflamed.
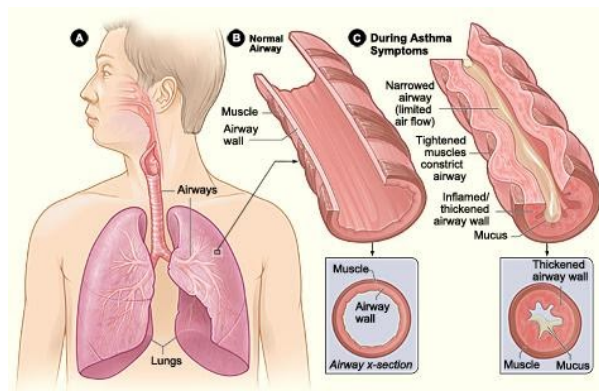


Figure 14.10 : Figure Ashows the location of the lungs and airways in the body. Figure Bshows a cross-section of a normal airway. Figure Cshows a cross-section of an airway during asthma symptoms. (Image by the National Hearth, Lung and Blood Institute is in the public domain)

Sometimes asthma symptoms are mild and go away on their own or after minimal treatment with asthma medicine. Other times, symptoms continue to get worse. When symptoms get more intense and/or more symptoms occur, you're having an asthma attack. Asthma attacks also are called flare-ups or exacerbations.

Figure 14.11: The different things that can trigger asthma. (Image by 7mike5000 is licensed under CC BY-SA 3.0. Image modified by adding content from a video by the CDC which is in the public domain)

Treating symptoms when you first notice them is important. This will help prevent the symptoms from worsening and causing a severe asthma attack. Severe asthma attacks may require emergency care, and they can be fatal. Asthma has no cure. Even when you feel fine, you still have the disease and it can flare up at any time.

However, with today's knowledge and treatments, most people who have asthma are able to manage the disease. They have few, if any, symptoms. They can live normal, active lives and sleep through the night without interruption from asthma. If you have asthma, you can take an active role in managing the disease. For successful, thorough, and ongoing treatment, build strong partnerships with your doctor and other health care providers.

## CHILDHOOD STRESS

Take a moment to think about how you deal with and how stress affects you. Now think about what the impact of stress may have on a child and their development.

Of course, children experience stress and different types of stressors differently. Not all stress is bad. Normal, everyday stress can provide an opportunity for young children to build coping skills and poses little risk to development. Even more long-lasting stressful events such as changing schools or losing a loved one can be managed fairly well. But children who experience toxic stress or who live in extremely stressful situations of abuse over long periods of time can suffer long-lasting effects. The structures in the midbrain or limbic system such as the hippocampus and amygdala can be vulnerable to prolonged stress during early childhood (Middlebrooks and Audage, 2008, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). High levels of the stress hormone cortisol can reduce the size of the hippocampus and effect the child's memory abilities. Stress hormones can also reduce immunity to disease. If the brain is exposed to long periods of severe stress it can develop a low threshold making the child hypersensitive to stress in

the future.  Whatever the effects of stress, it can be minimized if a child learns to deal with stressors and develop coping strategies with the support of caring adults. It's easy to know when your child has a fever or other physical symptoms. However, a child's mental health problems may be harder to identify.

## WHEN YOU HAVE A CONCERN ABOUT A CHILD. WHAT'S IN A LABEL?

Children are continually evaluated as they enter and progress through childcare and school. If a child is showing a need, they should be assessed by a qualified professional who would make a recommendation or diagnosis of the child and give the type of instruction, resources, accommodations, and support that they should receive.

Ideally, a proper diagnosis or label is extremely beneficial for children who have education, social, emotional or developmental needs. Once their difficulty, disorder, or disability is labeled then the child will receive the help they need from parents, educators, and any other professional who will work as a team to meet the student's individual goals and needs.

However, it's important to consider that children that are labeled without proper support and accommodations or worse they may be misdiagnoses will have negative consequences. A label can also influence the child's self-concept, for example, if a child is misdiagnosed as having a learning disability; the child, teachers, and family member interpret their actions through the lens of that label. Labels are powerful and can be good for the child or they can be detrimental for their development all depending on the accuracy of the label and if they are accurately applied.

A team of people who include parents, teachers, educational advocates and any other support staff will look at the child's evaluation assessment to develop an Individual Education Plan (IEP). The team will discuss the diagnosis, recommendations, and the accommodations and/or modifications.  A decision will be made regarding what is best for the child. This is the time when parents or caregivers decide if they would like to follow this plan or they can dispute any part of the process. During meetings to develop the IEP, the team is able to voice concerns and questions. Parents may feel empowered when they leave these meetings. They feel as if they are a part of the team and that they know what, when, why and how their child will be helped.

## Summary

In this chapter we looked at:

- Patterns of physical growth.

- Nutritional needs.

- Causes of obesity and the negative consequences of excessive weight gain.

- Challenges to physical health including vision, hearing, oral health, diabetes, asthma and childhood stress.

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**CHAPTER  15**

## *Cognitive Development in Middle Childhood*

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**Chapter Objectives**

After this chapter, you should be able to:

- Explain how cognitive theorists describe children's cognitive development and thinking in the middle years.

- Explain how intelligence is measured, the tests used to assess intelligence, the extremes in intelligence, and the concern of bias

- Describe the Information Processing Theory

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### INTRODUCTION

During middle and late childhood, children continue to explore their world with purpose. Cognitive skills continue to develop with an increasing ability to make inquiries, problem solve, classify information and data and make representations that support children to make sense of, and describe, the world and their experiences. In this period of development, they begin to 'think about thinking' referred to as metacognition and evaluate what they already know and what they still have to learn.

Thought processes that become more logical and organized when dealing with concrete and increasingly more abstract information. Children at this age understand concepts such as past, present, and future, giving them the ability to plan and work toward goals. Additionally, they can process complex ideas such as addition and subtraction and cause-and-effect relationship.

For most children, school becomes a context for development and where their abilities are assessed and reported on. Throughout childhood and beyond there are many factors which influence an individual's overall cognitive development. These include their socioeconomic status, parenting, their lived experiences and individual differences in cognitive process, and these differences predict both their readiness for school, academic performance, and testing in school (Prebler, Krajewski, & Hasselhorn, 2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

The Continuum of Development describes a number of skills pertaining to children's cognitive development domain during middle childhood. These include an increasing ability to self-regulate, an interest in games with rules and further development of mathematical skills such as describing patterns, spatial reasoning, creating and using maps (Ontario Ministry of Education, 2014).

## COGNITIVE THEORIES OF INTELLIGENCE


Figure 15.1: Jean Piaget (image is in the public domain)

Theorists are able to give different perspectives to the cognitive development of children and psychologists have long debated how to best conceptualize and measure intelligence (Sternberg, 2003, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). In the next section, we'll look at Piaget's theory of cognitive development, Sternberg's alternative view to intelligence, and Gardener's theory of multiple intelligence. Lastly, you'll learn about the Information Processing Theory that looks at the cognitive function of children in middle childhood.

## PIAGET'S THEORY OF COGNITIVE DEVELOPMENT

**Cognitive Operational Thought**

As children continue into elementary school, they develop the ability to represent ideas and events with more logic and flexibility. Piaget called this period the concrete operational stage because children mentally "operate" on concrete objects and events.

The concrete operational stage is defined as the third in Piaget's theory of cognitive development. This stage takes place around 7 years old to 11 years of age and is characterized by the development of organized and rational thinking. Piaget (1954a, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) considered the concrete stage a major turning point in the child's cognitive development, because it marks the beginning of logical or operational thought. The child is now mature enough to use logical thought or operations (i.e. rules) but can only apply logic to physical objects (hence concrete operational). Children gain the abilities of conservation (number, area, volume, orientation) and reversibility (Lally & Valentine-French, 2019).


Figure 15.2: Children studying (Image is licensed under CC0)

These skills allow children to solve problems more systematically than before, and therefore to be successful

with many academic tasks. In the concrete operational stage, for example, a child may unconsciously follow the rule: "If nothing is added or taken away, then the amount of something stays the same."

Let's look at the following cognitive skills that children typically master during Piaget's concrete operational stage 6:
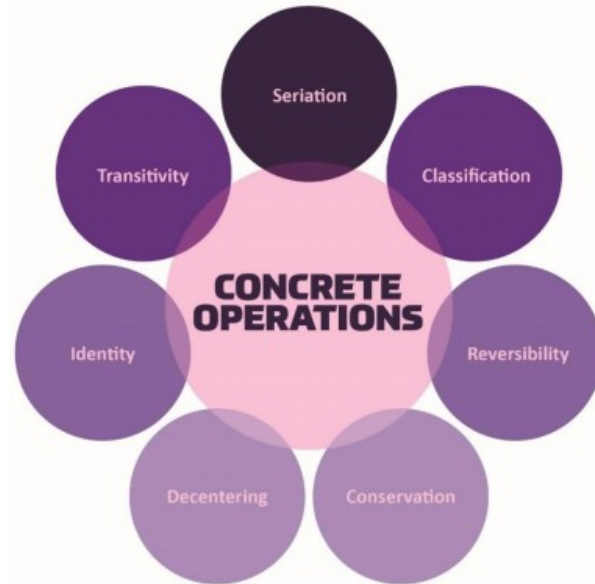


Figure 15.3: The cognitive skills developed during the concrete operational stage. (Image by Ian Joslin is licensed under CC-BY 4.0)

**Seriation:** Arranging items along a quantitative dimension, such as length or weight, in a methodical way is now demonstrated by the concrete operational child. For example, they can methodically arrange a series of different-sized sticks in order by length, while younger children approach a similar task in a haphazard way (Lally & Valentine-French, 2019).
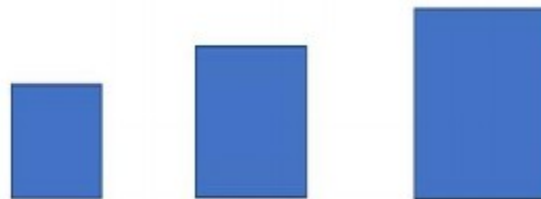


Figure 15.4: Putting these rectangles from smallest to largest is seriation. (Image by MehreenH is licensed CC BY-SA 4.0)

**Classification:** As children gain more experiences and their vocabularies expand, they build schema and can recognize and perhaps describe attributes and organize objects in many different ways. They also understand classification hierarchies and can arrange objects into a variety of classes and subclasses.

**Reversibility:** The child learns that some things that have been changed can be returned to their original state. Water can be frozen and then thawed to become liquid again. But eggs cannot be unscrambled. Arithmetic operations are reversible as well: 2 + 3 = 5 and 5 − 3 = 2. School curricula around the world reflects children's developing cognitive skills and educators are encouraged to provide opportunities for children to explore and demonstrate these new skills and increased awareness.

**Conservation:** In the chapter describing Piaget's pre-operational stage of cognitive development, you learned that a child in this stage would believe that if you were to fill a tall beaker with 8 ounces of water they would think that it was "more" than a short, wide bowl filled with 8 ounces of water. Children in the Concrete operational stage can understand the concept of conservation, which means that changing one attribute (in this example, height or water level) can be compensated for by changes in another attribute (width). Consequently, there is the same amount (conserved) of water in each container, although one is taller and narrower and the other is shorter and wider. Children in the pre operational stage may look at the attribute of height or depth and believe that the taller container has more water (depth) .
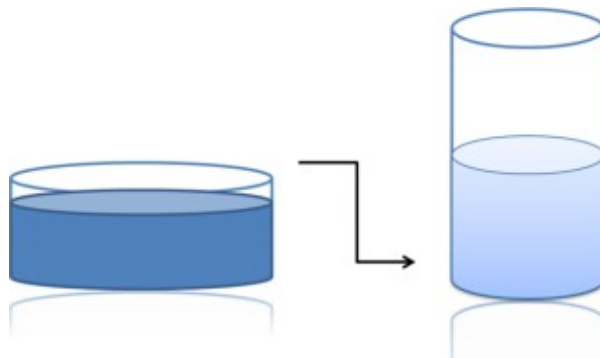
**Decentration:** Children in the concrete operational stage of development children no longer focus on only one dimension or attribute of any object (such as the height of the glass) and instead consider the changes in other dimensions and attributes also (such as the width of the glass). This allows for conservation to occur.

Figure 15.8: Children looking at these glasses demonstrate decentration when looking at more than one attribute i.e. tall, short, and wide narrow. (Image by Waterlily16 is licensed under CC by-SA 3.0)

**Identity:** One feature of concrete operational thought is the understanding that objects have qualities or attributes that do not change even if the object is altered in some way. For instance, mass of an object does not change by rearranging it. A piece of chalk is still chalk even when the piece is broken in two (Lally & Valentine-French, 2019).







Figure 15.9: A broken egg is still an egg (Image bu John Liu is licensed under CC-BY 2.0)

Figure 15.10: A deflated balloon is still a balloon. (Image is licensed under CC0)

Figure 15.11: Broken chalk is still chalk. (Image from Pexels)

**Transitivity:** This refers to the ability to understand how objects are related to one another is referred to as transitivity or transitive inference. This means that if one understands that a dog is a mammal and that a boxer is a dog, then a boxer must be a mammal.

Figure 15.12- Transitivity allows children to understand that the boxer puppy is a dog and a mammal. (Image by Martin Vorel is in the public domain)

## INTELLIGENCE TESTS AND THOSE WHO CREATED THEM

Piaget described human cognition as developing in distinct and somewhat discontinuous stages while other researchers (e.g. Sternberg 1997; 1999, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) describe cognitive development as more continuous in nature. In this section we will examine some views of human intelligence.

### Alfred Binet & Théodore Simon – Stanford- Binet Intelligence Test

From 1904- 1905 the French psychologist Alfred Binet (1857–1914) and their colleague Théodore Simon (1872–1961) began working on behalf of the French government to develop a measure that would identify children who would not be successful with the regular school curriculum. The goal was to help teachers better educate these students (Aiken, 1994, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

Binet and Simon developed what most psychologists today regard as the first intelligence test, which consisted of a wide variety of questions that included the ability to name objects, define words, draw pictures, complete sentences, compare items, and construct sentences. Binet and Simon (Binet, Simon, & Town, 1915; Siegler, 1992, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) believed that the questions they asked the children all assessed the basic abilities to understand, reason, and make judgments.



Figure 15.13:  Alfred Binet (Image is in the public domain)

Figure 15.14: This page is from a 1908 version of the Binet-Simon Intelligence Scale. Children being tested were asked which face, of each pair, was prettier. (Image is in the public domain)

Soon after Binet and Simon introduced their test, the American psychologist Lewis Terman at Stanford University (1877–1956) developed an American version of Binet's test that became known as the Stanford-Binet Intelligence Test. The Stanford-Binet is a measure of general intelligence made up of a wide variety of tasks including vocabulary, memory for pictures, naming of familiar objects, repeating sentences, and following commands.

## David Wechsler- Wechsler-Bellevue Intelligence Scale

In 1939, David Wechsler, a psychologist who spent part of their career working with World War I veterans, developed a new IQ test in the United States. Wechsler combined several subtests from other intelligence tests used between 1880 and World War I. These subtests tapped into a variety of verbal and nonverbal skills because Wechsler believed that intelligence encompassed "the global capacity of a person to act purposefully, to think rationally, and to deal effectively with their environment" (Wechsler, 1958, p. 7, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). The test was named the Wechsler-Bellevue Intelligence Scale (Wechsler, 1981, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). This combination of subtests became one of the most extensively used intelligence tests in the history of psychology.



Figure 15.15: David Wechsler (Image by Comet Photo AG (Zurich) is licensed under CC BY-SA 4.0)

Today, there are three intelligence tests credited to Wechsler, the Wechsler Adult Intelligence Scale-fourth edition (WAIS-IV), the Wechsler Intelligence Scale for Children (WISC-V), and the Wechsler Preschool and Primary Scale of Intelligence—Revised (WPPSI-III) (Wechsler, 2002, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## Bias of IQ Testing

Intelligence tests and psychological definitions of intelligence have been heavily criticized since the 1970s for being biased in favor of Anglo-American, middle-class respondents and for being inadequate tools for measuring non-academic types of intelligence or talent. Intelligence changes with experience, and intelligence quotients or scores do not reflect that ability to change. What is considered smart varies culturally as well, and most intelligence tests do not take this variation into account. For example, in the West, being smart is associated with being quick. A person who answers a question the fastest is seen as the smartest, but in some cultures being smart is associated with considering an idea thoroughly before giving an answer. In these cultures, a well-thought out, contemplative answer is the best answer (Lally & Valentine-French, 2019). This view is also seen in Indigenous cultures were children are taught to be mindful about the words being used before answering a question.

## A Spectrum of Intellectual Development

The results of studies assessing the measurement of intelligence show that IQ is distributed in the population in

the form of a Normal Distribution (or bell curve), which is the pattern of scores usually observed in a variable that clusters around its average. In a normal distribution, the bulk of the scores fall toward the middle, with many fewer scores falling at the extremes. The normal distribution of intelligence shows that on IQ tests, as well as on most other measures, the majority of people cluster around the average (in this case, where IQ = 100), (see below).
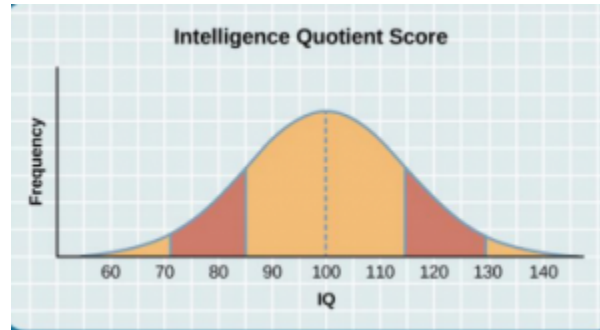


Figure 15.16: The majority if people have an IQ score between 85 & 115. (Image by CNX Psychology is licensed under CC BY 4.0)

## DISTRIBUTION OF IQ SCORES IN THE GENERAL POPULATION

The normal distribution of IQ scores in the general population shows that most people have about average intelligence, while very few have extremely high or extremely low intelligence (Lally & Valentine-French, 2019).

This means that about 2% of people score above an IQ of 130, often considered the threshold for giftedness, and about the same percentage score below an IQ of 70, often being considered the threshold for an intellectual disability.

## TRIARCHIC THEORY OF INTELLIGENCE

An alternative view of intelligence is presented by Sternberg (1997; 1999, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Sternberg offers three types of intelligences. Sternberg provided background information about their view of intelligence in a conference, where they described their frustration as a committee member charged with selecting graduate students for a program in psychology. Sternberg was concerned that there was too much emphasis placed on aptitude test scores (we will discuss this later in the chapter) and believed that there were other, less easily measured, qualities necessary for success in a graduate program and in the world of work.

These include:
1. **Analytical** (componential) sometimes described as academic: includes the ability to solve problems of logic, verbal comprehension, vocabulary, and spatial abilities
2. **Creative** (experiential): the ability to apply newly found skills to novel situations
3. **Practical** (contextual): the ability to use common sense and to know what is called for in a situation

Figure 15.17: Reading supports analytical intelligence (Image licensed under CC0)

Figure 15.18: Building with lego shows creative intelligence (Image licensed under CC0)

Figure 15.19: Navigating social settings is practical intelligence (Image by Steven Depolo is licensed under CC BY 2.0)

## HOWARD GARDNER'S THEORY OF MULTIPLE INTELLIGENCES



Figure 15.20: Howard Gardner. (Image by Interaction-Design.org is licensed under CC BY-SA 2.0)

Another champion of the idea of specific types of intelligences rather than one overall intelligence is the psychologist Howard Gardner (1983, 1999, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). In the book Frames of Mind published in 1983, Gardner argued that it would be evolutionarily functional for different people to have different talents and skills, and proposed that there are nine intelligences that can be differentiated from each other.

Gardner contends that these are also forms of intelligence. A high IQ does not always ensure success in life or necessarily indicate that a person has common sense, good interpersonal skills, or other abilities important for success. Gardner investigated intelligences by focusing on children who were talented in one or more areas. In Gardner's original work, he identified 7 intelligences based on other criteria including a set developmental history and psychometric findings . Gardner's research demonstrated that in most individuals, two or the seven types of intelligence are dominant. (Lally & Valentine-French, 2019).

In 1995, Gardner added an eighth intelligence: naturalistic intelligence. In 2020,  he added a ninth intelligence: existential intelligence. Descriptions of the nine intelligences are in the chart below.

Many inventories have been developed to describe an individual's Multiple Intelligences profile. These inventories can be used to determine which two types of intelligence are dominant in an individual, however, developing all nine intelligences is encouraged. There are many Multiple Intelligence inventories that can be accessed for free online. If you have never completed one, take a few moments to do so. The results may surprise you!

**Table 15.1 Howard Gardner's Multiple Intelligences**

| Intelligence | Description |
| --- | --- |
| Linguistic | The ability to speak and write well |
| Logical-mathematical | The ability to use logic and mathematical skills to solve problems |
| Spatial | The ability to think and reason about objects in three dimensions |
| Musical | The ability to perform and enjoy music |
| Kinesthetic (body) | The ability to move the body in sports, dance, or other physical activities |
| Interpersonal | The ability to understand and interact effectively with others |
| Intrapersonal | The ability to have insight into the self |
| Naturalistic | The ability to recognize, identify, and understand animals, plants, and other living things |
| Existential | The ability to understand and have concern from life's larger questions, the meaning of life, and other spiritual matters |

Table 15.1- Howard Gardner's Multiple Intelligences (Lifespan Development: A Psychological Perspective by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0; Table adapted from Gardner, H. (1999). Intelligence reframed: Multiple intelligence

Let's consider how  Gardner's theory of multiple intelligences helps early childhood educators support children's holistic development and work with families as partners. It is an expectation that educators observe children's play and interests to co plan learning opportunities and environments that align with the vision described in How Does Learning Happen?  Being aware of Gardner's nine types of intelligence facilitates educators to offer a broad range of opportunities for children. Opportunities which embrace the nine types of intelligence support all children's development and well-being. Some children will be engaged because the opportunity recognizes one of their dominant intelligences while others may be curious to explore an opportunity that supports an intelligence that may not be dominant for them. This practice also reflects Loris Malaguzzi's concept "One Hundred Languages of Children". Loris Mallaguzzi (1920-1994) was the founder of the Reggio Emilia Approach. They believed that there are multiple ways that children can express their ideas, thoughts and feelings.

The concept of multiple intelligences has been influential in the field of formal education and where teachers have used Gardner's theory to differentiate instruction for individual students. Multiple intelligence theory (Gardner, 1983, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) can be considered in three main areas: the manner in which a lesson is presented, the tasks assigned to students and the way students can demonstrate their understanding (assessment). For instance, to teach math problems to students who have particularly good a high degree of kinesthetic intelligence, a teacher might encourage the students to move their bodies or hands according to the numbers (Lally & Valentine-French, 2019).

Gardner's theory of Multiple Intelligences  has  been critiqued by some who argue that  these  "intelligences" sometimes seem more like "abilities" or "talents" rather than real intelligence, however, an awareness of this theory can support teaching, learning and holistic development.

## INTELLIGENCE TESTING – THE WHAT, THE WHY, AND THE WHO

**Measuring Intelligence: Standardization and the Intelligence Quotient**

The goal of most intelligence tests is to measure "g", the general intelligence factor. Good intelligence tests are reliable, meaning that they are consistent over time, and also demonstrate validity, meaning that they actually measure intelligence rather than something else. Over time, psychologists have invested substantial effort in creating and improving measures of intelligence.

Understanding intelligence requires that we know the norms or standards in a given population of people at a given age. The standardization of a test involves administering the test to a large population at different ages and computing the average score on the test at each age level.
Once the standardization has been achieved, we have a picture of the average abilities of people at different ages and can calculate a person's mental age, which is the age at which a person is performing intellectually. If we compare the mental age of a person to the person's chronological age, the result is the Intelligence Quotient (IQ), a measure of intelligence that is adjusted for age. A simple way to calculate IQ is by using the following formula:

**IQ = mental age ÷ chronological age × 100.**

Thus a 10-year-old child who does as well as the average 10-year-old child has an IQ of 100 (10 ÷ 10 × 100), whereas an 8-year-old child who does as well as the average 10-year-old child would have an IQ of 125 (10 ÷ 8 × 100). Most modern intelligence tests are based on the relative position of a person's score among people of the same age, rather than on the basis of this formula, but the idea of intelligence "ratio" or "quotient" provides a good description of the score's meaning.

### The Flynn Effect

It is important that intelligence tests be standardized on a regular basis, because the overall level of intelligence in a population may change over time. The Flynn Effect refers to the observation that scores on intelligence tests worldwide have increased substantially over the past decades (Flynn, 1999, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Although the increase varies somewhat from country to country, the average increase is about 3 IQ points every 10 years. There are many explanations for the Flynn Effect including better nutrition, increased access to information, and more familiarity with multiple-choice tests (Neisser, 1998, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). But whether people are actually getting smarter is debatable (Neisser, 1997, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## THE VALUE OF IQ TESTING

The value of IQ testing is most evident in educational or clinical settings. Children who seem to be experiencing learning difficulties or severe behavioural problems can be tested to ascertain whether their difficulties can be partly attributed to an IQ score that is significantly different from the mean for their age group. Without IQ testing—or another measure of intelligence—children and adults needing extra support might not be identified effectively. Cognitive assessments can be used to identify such exceptionalities as cognitive impairments, learning disabilities and academic giftedness. The results of assessments can be used to develop an Individualized Education Plan (IEP) to support a student's learning and success. School boards across the province have a responsibility to meet the provincial standards around IEPs. This often includes creating "Identification, Placement and Review Committees" (IPRC) to support the success of students with exceptionalities (Ontario Ministry of Education, 2007).

## INTELLECTUAL EXCEPTIONALITIES

One end of the distribution of intelligence scores is defined by people with very low IQ. Intellectual disability (or intellectual developmental disorder) is assessed based on cognitive capacity (IQ) and adaptive functioning. The severity of the disability is based on adaptive functioning, or how well the person handles everyday life tasks. One example of an intellectual developmental disorder is Down syndrome (also known as Trisomy 21),  a chromosomal disorder caused by the presence of all or part of an extra 21st chromosome. The incidence of Down syndrome is estimated at approximately 1 per 700 births, and the prevalence increases as the mother's age increases (Centre for Disease Control and Prevention, 2014, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). People with Down syndrome typically exhibit a distinctive pattern of physical features, including a flat nose, upwardly slanted eye, a protruding tongue, and a short neck.

A particular vulnerability of people with low IQ is that they may be taken advantage of by others, and this is an important aspect of the definition of intellectual developmental disorder (Greenspan, Loughlin, & Black, 2001, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).



Figure 15.21:  Down syndrome is caused by the presence of all or part of an extra 21st chromosome. (Image by Vanellus Foto is Licensed under CC BY-SA)

## TESTING IN SCHOOLS

Children's academic performance is often measured with the use of standardized tests.



Figure 15.22:  Standardized test are used to measure academic performance. (Image by Marine Coprps Base Hawaii is in the public domain)

In Ontario, the Education Quality and Accountability Office (EQAO) (2020) evaluates how well Ontario's public education system is developing children's reading writing and mathematical skills. The agency is an arm's length government agency that co-ordinates Ontario's participation in national and international assessments. Each student who writes an assessment is provided with individualized feedback to support learning and schools and school boards receive detailed information about their students' achievement to inform school planning and instructional improvement. The overall results for each school are made public to keep publicly funded schools accountable to the public.

Through EQAO's standardized tests, students' language and math skills are assessed in grades 3 and 6. Mathematic skills are tested in grade 9 and literacy skills are tested in grade 10. It is important to remember that these tests are more about evaluating education than about individual children. Test scores have no impact on a student's report card, with the exception of the standardized Ontario Secondary School Literacy Test which must be passed (or substituted with a literacy course) in order to graduate from high school (EQAO, 2020).

Annually the results of the standardized test influence research in education and the professional learning opportunities offered to educators with the goal of improving the rankings and student success (EQAO, 2020).

## INFORMATION PROCESSING – LEARNING, MEMORY AND PROBLEM SOLVING

During middle and late childhood children make strides in several areas of cognitive function including the capacity of working memory, their ability to pay attention, and their use of memory strategies. Both changes in the brain and experience foster these abilities. In this section, we will look at how children process information, think and learn, allowing them to increase their ability to learn and remember due to an improvement in the ways they attend to, store information, and problem solve (Lally & Valentine-French, 2019).



**Working Memory**

The ability to temporarily hold and manipulate information for cognitive tasks performed in daily life.

Working memory holds information for a few seconds. It is temporary.

Working memory can hold only five to seven items at a time. It has a small capacity.

Working memory holds and manipulates information.

Working memory depends on control of attention and mental effort.

Figure 15.23:  Working memory expands during middle and late childhood. (Image by Anchor is licensed under CC BY-NC-SA)

**Working Memory:**  Research has suggested that both an increase in processing speed and the ability to inhibit irrelevant information from entering memory are contributing to the greater efficiency of working memory during this age (de Ribaupierre, 2002, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Changes in myelination and synaptic pruning in the cortex are likely behind the increase in processing speed and ability to filter out irrelevant stimuli (Kail, McBride-Chang, Ferrer, Cho, & Shu, 2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

**Attention:** As noted above, the ability to inhibit irrelevant information improves during this stage of development with a sharp improvement in selective attention from age six into adolescence (Vakil, Blachstein, Sheinman, & Greenstein, 2009, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Children also improve in their ability to shift their attention between tasks or different features of a task (Carlson, Zelazo, & Faja, 2013, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). A younger child who is asked to sort objects into piles based on the type of object, car versus animal, or color of the object, red versus blue, would likely have no trouble doing so. But if you ask them to switch from sorting based on type to now having them sort based on color, they would struggle because this requires them to suppress the prior sorting rule. An older child has less difficulty making the switch, meaning there is greater flexibility in their attentional skills. These changes in attention and working memory contribute to children having more strategic approaches to challenging tasks.

**Memory Strategies:** Bjorklund (2005, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) describes a developmental progression in the acquisition and use of memory strategies as children progress through elementary school. Examples of memory strategies include rehearsing information you wish to recall, visualizing and organizing information, creating rhymes, such as "i" before "e" except after "c", or inventing acronyms, or pneumonic device such as "roygbiv" to remember the colors of the rainbow. In a longitudinal study Schneider, Kron-Sperl, and Hünnerkopf (2009, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) reported a steady increase in the use of memory strategies from ages six to ten. Moreover, by age ten many children were using two or more memory strategies to help them recall information. Schneider and colleagues found that there were considerable individual differences at each age in the use of strategies and that children who utilized more strategies had better memory performance than their same-aged peers.

## COGNITIVE PROCESSES



Figure 15.24:  As children learn more about the world, their knowledge base grows. (Image is licensed under CC0)

As children enter school and learn more about the world, their knowledge base expands, and becomes more refined as they develop more categories for concepts (Berger, 2014, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). They learn more efficient strategies for storing and retrieving information.

Metacognition: As mentioned earlier, this refers to the knowledge we have about our own thinking and our ability to use this awareness to regulate our own cognitive processes (Bruning, Schraw, Norby, & Ronning, 2004,

as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Children in this developmental stage can' think about thinking' and are better able to evaluate their performance of   a task and the level of difficulty of the task. As they become more aware of their abilities, they can set goals and adapt studying strategies to support their success.

## CRITICAL THINKING

According to the Ontario Mathematics Curriculum (Ontario Ministry of Education, 2020) critical thinking can be described as: "the process of thinking about ideas or situations in order to understand them fully, identify their implications, make a judgement, and/or guide decision making."

Critical thinking includes a number of skills such as questioning, predicting, analysing, synthesizing, examining opinions, identifying values and issues, detecting bias, and distinguishing between alternatives (Ontario Ministry of Education, 2020).  It is important to teach children these thinking skills so they can become individuals who can engage in detailed examination of beliefs, courses of action, and evidence, and evaluate information to make informed decisions that can have a positive impact on the world. Critical thinking involves better understanding a problem through gathering, evaluating, and selecting information, and also by considering many possible solutions. Ennis (1987, as cited in Ontario Ministry of Eduction, 2020) identified several skills useful in critical thinking.  Metacognition is essential to critical thinking because it allows us to reflect on the information as we make decisions and move beyond superficial conclusions to a deeper understanding of the issues being examined (Ontario Ministry of Education, 2020).

### Indigenous Perspectives

   Indigenous children are not seen as having disabilities, they are considered as having different gifts that others may not have. They are regarded as being brought to the mother and father, to the community, and other family members to show them something. It is seen in a wholistic way. Take for instance in the case of someone who has impaired vision, their other senses are higher than someone who does not have that exceptionality.

### Summary

In this chapter we looked at:

- Piaget's concrete operational stage of cognitive development.
- Theories of intelligence.
- Intelligence testing.
- Intellectual exceptionalities
- Academic testing in schools
- How children process information.
- Critical thinking

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**CHAPTER  16**

## *Social Development in Middle Childhood*

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**Chapter Objectives**

After this chapter, you should be able to:

- Describe the continuum of development of social skills during middle childhood
- Describe social theories of development

- Examine a variety of family structures
- Discuss the effects of divorce on children in middle childhood
- Examine the importance of positive friendships and peer relationships
- Explain aggression, antisocial behaviour, and bullying.

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### INTRODUCTION

Between the ages of 6 and 12 years, children experience significant changes in their relationships with adults and peers. Let's examine some of these important social interactions during these years.

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**Indigenous Perspectives**

   Between the ages of 9 and 12, First Nation children are learning more and more about their responsibilities within the scope of family and community. This is a crucial time because hormones are starting to be more prominent in their bodies. They are starting to search for what their place is in the community. In the northernmost communities, boys (and some girls) from traditional/cultural families who exercise their right to harvest for food are being taught to hunt, trap and fish as well as harvesting foods that grow in the wild by a male relative. They will spend time with grandfathers to learn many skills. In some nations, the boys learn the Buffalo Dance. This teaching focuses on showing young men how to respect young women and their responsibilities when they become fathers. Girls are given more responsibilities regarding taking care of siblings and learning how to cook; especially in large families where there are many children. Women have more responsibilities in that they are more stationary; therefore, they tend to do most everything that has to do with taking care of the home, raising the children and knowing their place in the community. They are also shown skills such as sewing, beadwork, quillwork, tanning skins, doing laundry, etc. Those that follow ceremonies will spend time with the grandmothers to be taught the teachings of Moon Time (menses) and harvesting food and medicines. Within southernmost nations, they have adopted more of an agricultural and small game lifestyle due to better weather conditions. Both males and females learn to tend the crops, snare for small game and fish. Because males don't have to go very far to harvest game, their

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role is more as a protector of the family and community. From a traditional/cultural viewpoint, they follow longhouse teachings depending on which nation they belong to. It is not uncommon for either sexes to go live with their grandparents to acquire their knowledge so that it can be passed down from generation to generation. It is also important to note that due to the residential school experience, many families have gone through colonization which has drastically altered their lifestyle; therefore, some families no longer practice their ancestral way of life.

## CONTINUUM OF DEVELOPMENT

The Continuum of Development identifies several root social skills that are emerging in children. Between the ages of 5-8, friendships become increasingly important. Children start to have a "best friend". Peer relationships are more stable because conflict resolution and problem-solving skills are improving. During these years, children are able to co-operate, share, help and show empathy for others. They are better able to self-regulate their behaviour because they are now capable of taking another person's point of view and see how their behaviour affects someone else (Ontario Ministry of Education, 2014). Between the ages of 9-12, friends begin to have even more influence. This is referred to as "peer pressure"; the feeling that one must do what one's peers are doing in order to be accepted by the group. Children this age start to want to put some physical and emotional distance between themselves and adults. They may begin to show interest in teen culture – music, social media, clothing and make-up. They feel strongly that they no longer want to be treated like a child (Ontario Ministry of Education, 2014).

## SOCIAL THEORIES OF DEVELOPMENT

**Erik Erikson- Industry vs. Inferiority**
Erik Erikson proposed that we are motivated by a need to achieve competence in certain areas of our lives. As we've learned in previous chapters, Erikson's psychosocial theory has eight stages of development over the lifespan, from infancy through late adulthood. At each stage, there is a conflict, or task, that we need to resolve. Successful completion of each developmental task results in a sense of competence and a healthy personality. Failure to master these tasks leads to feelings of inadequacy.

During middle childhood (ages 6-12), children face the task of Industry versus Inferiority. Children begin to compare themselves to their peers to see how they measure up.

Figure 12.1: The academic award this child is receiving may contribute to their sense of industry. (Image by Janarthanan Kesavan is licensed under CC BY-SA 4.0)

They either develop a sense of pride and accomplishment in their schoolwork, sports, social activities, and family life, or they feel inferior and inadequate when they don't measure up (OpenStax, n.d.).

According to Erikson, children in middle childhood are very busy or industrious. They are constantly doing, planning, playing, getting together with friends, achieving. This is a very active time and a time when they are gaining a sense of how they measure up when compared with friends. Erikson believed that if these industrious children can be successful in their endeavours, they will get a sense of confidence for future challenges. If not, a sense of inferiority can be particularly haunting during middle childhood.

**Sigmund Freud – Psychoanalytic Theory**

The psychoanalyst Sigmund Freud (1856–1939) focused on unconscious, biological forces that he felt shape individual personality. Freud thought that the personality consists of three parts: the id, the ego, and the superego. The id is the selfish part of the personality and consists of biological instincts that all babies have, including the need for food and, more generally, the demand for immediate gratification. As babies get older, they learn that not all their needs can be immediately satisfied and thus develop the ego, or the rational part of the personality. As children get older still, they internalize society's norms and values and thus begin to develop their superego, which represents society's conscience. Freud believed that, in the event a child's superego does not become strong enough, the individual is more at risk for being driven by the id to commit antisocial behaviour.



Figure 12.2: Development of the superego helps children overcome their unconscious desire to behave antisocially. (Image by Annie Spratt on Unsplash)

## CHILD AND THE FAMILY

One of the reasons we often turn out much like our parents is that our families are such an important part of our socialization process. When we are young, our primary caregivers are almost always one or both of our parents, either biological or non-biological. For several years we have more contact with them than with any other adults. Because this contact occurs in our most formative years, our parents' interaction with us and the messages they teach us can have a profound impact throughout our lives. During middle childhood, children start to spend less time with parents and more time with peers. Parents often find that they have to modify their approach to parenting to accommodate the child's growing independence. Using reason and engaging in joint decision-making whenever possible may be the most effective approach (Berk, 2007, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

Figure 12.3: When children grow up to love reading, they may have been influenced by the positive experiences of being read to by their families. (Image by San José Public Library is licensed under CC BY-SA 2.0)

**Family Atmosphere**

One of the ways to assess the quality of family life is to consider the tasks of families. Berger (2005, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) lists five family functions:

1. Providing food, clothing and shelter

2. Encouraging learning

3. Developing self-esteem

4. Nurturing friendships with peers

5. Providing harmony and stability

Notice that in addition to providing food, shelter, and clothing, families are responsible for helping the child learn, relate to others, and have a confident sense of self. The family provides a harmonious and stable environment for living. A supportive home environment is one in which the child's physical, cognitive, emotional, and social needs are adequately met. Sometimes families emphasize physical needs but ignore cognitive or emotional needs. Other times, families pay close attention to physical needs and academic requirement, but may fail to nurture the child's friendships with peers or guide the child toward developing healthy relationships. Parents might want to consider how it feels to live in the household. Is it stressful and conflict-ridden? Is it a place where family members enjoy being? (Lally & Valentine-French, 2019).

Figure 12.4: This mother is encouraging learning in their child. (Image by Intel Free Press is licensed under CC BY-SA 2.0)

**The Family Stress Model**

Family relationships are significantly affected by conditions outside the home. For instance, the **Family Stress Model** describes how financial difficulties are associated with parents' depressed moods, which in turn could lead to marital problems and poor parenting that contributes to poorer child adjustment (Conger, Conger, & Martin, 2010, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Divorce is typically associated with economic stresses for children and parents, the renegotiation of parent-child relationships (with one parent typically as primary custodian and the other assuming a visiting relationship), and many other significant adjustments for children. Divorce is often regarded by children as a sad turning point in their lives, although for most it is not associated with long-term problems of adjustment (Emery, 1999, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

Indigenous Perspectives

Many Indigenous families live in poverty due to a lack of employment opportunities; especially in small and remote communities. Non-traditional ideologies of parental responsibilities, have further put indigenous children at risk. Also, as previously mentioned, the lack of schools in remote communities has forced families to be separated. Often, the child has to move to an urban setting with family friends or with extended family members to attend school which, in turn, creates more trauma for the child. Finally, the onset of intergenerational trauma from the legacy of residential schools and colonization has created cases of substance abuse, high rates of suicide, spousal abuse, and child neglect in many Indigenous communities.

# Family Forms

As discussed previously in chapter 11, the sociology of the family examines the family as an institution and a unit of socialization. Sociological studies of the family look at demographic characteristics of the family members: family size, age, ethnicity and gender of its members, social class of the family, the economic level and mobility of the family, professions of its members, and the education levels of the family members.

Currently, one of the biggest issues that sociologists study are the changing roles of family members. The proportion of dual-earner Canadian families has roughly doubled in the last 40 years, from 36% of two parent families to 69%. Not only are more parents in the paid workforce; more dual-earner couples with children have two full-time working parents. As of 2015, 75% of dual-earner Canadian couples with children reported that both parents worked at least 30 hours per week (Statistics Canada, 2016). This dramatic increase in maternal employment is reflected in changing views about gender roles in the family. For example, in 1976 stay-at-home fathers accounted for roughly 1 in 70 families with a stay-at-home parent. By 2015, that ratio increased to 1 in 10 families (Statistics Canada, 2018).

**What Families Look Like**

Figure 12.5: a childless family (Image by Adam Jones is licensed under CC BY-SA 2.0



Figure 12.6: a single parent (father) family (Image is licensed under CC0



Figure 12.7: an extended family (Image by Joint Base Elmendorf-Richardson is in the public domain)

Figure 12.8: a same-sex family (Image by Surrogacy-UK is licensed under CC BY-SA 3.0)



Figure 12.9: a single parent (mother) family (Image is in the public domain)



Figure 12.10: a nuclear family (Image by Army Medicine is licensed under CC BY 2.0)

Throughout this textbook and in the preceding images, you can see a variety of types of families. A few of these family types were introduced in Chapter 11. The sections below list some of the diverse types of families:

## FAMILIES WITHOUT CHILDREN

**Singlehood family** contains a person who is not married or in a common-law relationship. He or she may share a relationship with a partner but lead a single lifestyle. Couples that are childless are often overlooked in the discussion of families.

## FAMILIES WITH ONE PARENT

A single-parent family usually refers to a parent who has most of the day-to-day responsibilities in the raising of the child or children, who is not living with a spouse or partner, or who is not married. The dominant caregiver is the parent with whom the children reside for the majority of the time; if the parents are separated or divorced, children live with their custodial parent and have visitation with their noncustodial parent. In western society in general, following a separation a child will end up with the primary caregiver, usually the mother, and a secondary caregiver, usually the father.

Single parent by choice families refer to a family that a single person builds by choice. These families can be built with the use of assisted reproductive technology and donor gametes (sperm and/or egg) or embryos, surrogacy, foster or kinship care, and adoption.

## TWO PARENT FAMILIES

The **nuclear family** (also referred to as the **elementary family** or the **conjugal family)** is a family group consisting of 2 parents and their children. While common in industrialized cultures, it is not actually the most common type of family worldwide.

**Cohabitation** is an arrangement where two people who are not married live together in an intimate relationship, particularly an emotionally and/or sexually intimate one, on a long-term or permanent basis. Today, cohabitation is a common pattern among people in the Western world.

### Indigenous Perspectives

Many Indigenous nations have a different outlook about marriage in which many do not get married; therefore, they would fall under cohabitating. Depending on whether the nation is matriarchal or patriarchal, the child would take on the last name of either the mother or the father. Some traditional families will have a traditional marriage; however, this is not as common today.

**Blended families** describe families formed when one or both parents with children from a former family create a new family. Blended families are complex in a number of ways that can pose unique challenges to those who seek to form successful relationships (Visher & Visher, 1985, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

## FAMILIES THAT INCLUDE ADDITIONAL ADULTS

**Extended families** include three generations, grandparents, parents, and children. This is the most common type of family worldwide.

**Families by choice** is increasingly being practiced by those who see benefits to including people beyond blood relatives in their families.

## ADDITIONAL FORMS OF FAMILIES

**Kinship families** are those in which the full-time care, nurturing, and protection of a child is provided by relatives, members of the child's First Nation, godparents, or other adults who have a family relationship to a child. When children cannot be cared for by their parents, research finds benefits to kinship care.

When a person assumes the parenting of another, usually a child, from that person's biological or legal parent or parents this creates **adoptive families**. Legal adoption permanently transfers all rights and responsibilities and is intended to affect a permanent change in status and as such requires societal recognition, either through legal or religious sanction. As introduced in Chapter 2, adoption can be done privately, through an agency, or through foster care, both domestically or from abroad. Adoptions can be closed (no contact with birth/biological families or open, with different degrees of contact with birth/biological families). Couples, both opposite and same-sex, and single parents can adopt (although not all agencies and foreign countries will work with unmarried, single, or same-sex intended parents).

When parents are not of the same ethnicity, they build interracial families. There are parts of the world where marrying someone outside of your race (or social class) has legal and social ramifications. These families may experience issues unique to each individual family's culture.

### Indigenous Perspectives

In first nation communities there may not be a legal adoption; however, a child may be raised by an aunt and uncle, a close family friend or grandparents without any papers being signed. It is a mutual agreement between the family member and the adopted family. This way the biological parents can still have a part to play in the child's life. Sometimes it is in the best interest of the child. Sometimes the child is taken care of by that family because the parents are not yet ready to rear children or they are pursuing their education to better their lives. It is a very unique way that I have come to appreciate. Many people may judge the families.

## CHANGES IN FAMILIES – DIVORCE

The tasks of families listed above are functions that can be fulfilled in a variety of family types. Harmony and stability can be achieved in many family forms and when it is disrupted, either through divorce, or efforts to blend families, or any other circumstances, the child may suffer (Hetherington & Kelly, 2002, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Changes continue to happen, but for children they are especially vulnerable. Divorce and how it impacts children depends on how the caregivers handle the divorce as well as how they support the emotional needs of the child.

Figure 12.13: How divorce impacts children largely depends on how parents handle it. (Image by Tony Guyton is licensed under CC BY 2.0)

## DIVORCE

A lot of attention has been given to the impact of divorce on the life of children. The assumption has been that divorce has a strong, negative impact on the child and that single-parent families are deficient in some way. However, 75-80 percent of children and adults who experience divorce suffer no long-term effects (Hetherington & Kelly, 2002, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). An objective view of divorce, re–partnering, and remarriage indicates that divorce, remarriage and life in blended families can have a variety of effects.

## FACTORS AFFECTING THE IMPACT OF DIVORCE

As you look at the consequences (both pro and con) of divorce and remarriage on children, keep the previously mentioned family functions in mind. Some negative consequences are a result of financial hardship rather than divorce per se (Drexler, 2005, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Some positive consequences reflect improvements in meeting these functions. For instance, we have learned that a positive self-esteem comes in part from a belief in the self and one's abilities rather than merely being complimented by others. In single-parent homes, children may be given more opportunity to discover their own abilities and gain independence that fosters self-esteem. If divorce leads to fighting between the parents and the child is included in these arguments, their self-esteem may suffer.

The impact of divorce on children depends on a number of factors. The degree of conflict prior to the divorce plays a role. If the divorce means a reduction in tensions, the child may feel relief. If the parents have kept their conflicts hidden, the announcement of a divorce can come as a shock and be met with enormous resentment. Another factor that has a great impact on the child concerns financial hardships they may suffer, especially if financial support is inadequate. Another difficult situation for children of divorce is the position they are put into if the parents continue to argue and fight—especially if they bring the children into those arguments.

**Short-term consequences:** In roughly the first year following divorce, children may exhibit some of these short-term effects:

**1. Grief over losses suffered.** The child will grieve the loss of the parent they no longer see as frequently. The child may also grieve about other family members that are no longer available. Grief sometimes comes in the form of sadness but it can also be experienced as anger or withdrawal. Older children may feel depressed.

**2. Reduced Standard of Living.** Very often, divorce means a change in the amount of money coming into the household. Children experience new constraints on spending or entertainment. School-aged children, especially, may notice that they can no longer have toys, clothing or other items to which they've grown accustomed. Or it

may mean that there is less eating out or being able to afford cable television, and so on. The custodial parent may experience stress at not being able to rely on child support payments or having the same level of income as before. This can affect decisions regarding healthcare, vacations, rents, mortgages and other expenditures. And the stress can result in less happiness and relaxation in the home. The parent who has to take on more work may also be less available to the children.

**3. Adjusting to Transitions.** Children may also have to adjust to other changes accompanying a divorce. The divorce might mean moving to a new home and changing schools or friends. It might mean leaving a neighbourhood that has meant a lot to them as well.

**Long-term consequences:** Here are some effects that go beyond just the first year following divorce:

**1. Economic/Occupational Status.** One of the most commonly cited long-term effects of divorce is that children of divorce may have lower levels of education or occupational status. This may be a consequence of lower income and resources for funding education rather than to divorce per se. In those households where economic hardship does not occur, there may be no impact on economic status (Drexler, 2005, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

**2. Improved Relationships with the Custodial Parent (usually the mother):** Most children of divorce lead happy, well-adjusted lives and develop stronger, positive relationships with their custodial parent (Seccombe and Warner, 2004, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Others have also found that relationships between mothers and children become closer and stronger (Guttman, 1993, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) and suggest that greater equality and less rigid parenting is beneficial after divorce (Steward, Copeland, Chester, Malley, and Barenbaum, 1997, as cited by Paris, Ricardo, Raymond, & Johnson, 2021).

**3. Greater emotional independence in sons.** Drexler (2005, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) notes that sons who are raised by mothers only develop an emotional sensitivity to others that is beneficial in relationships.

**4. Feeling more anxious in their own love relationships.** Children of divorce may feel more anxious about their own relationships as adults. This may reflect a fear of divorce if things go wrong, or it may be a result of setting higher expectations for their own relationships.

**5. Adjustment of the custodial parent.** Furstenberg and Cherlin (1991, as cited by Paris, Ricardo, Raymond, & Johnson, 2021) believe that the primary factor influencing the way that children adjust to divorce is the way the custodial parent adjusts to the divorce. If that parent is adjusting well, the children will benefit. This may explain a good deal of the variation we find in children of divorce.



Figure 12.14: Jeanette Wilinski is the mother of Elizabeth, Logan and Alexis. A single mom has to find a balance between taking care of the Air Force mission and taking care of their children. (Image by the Scott Air Force Base is in the public domain)

Families are the most important part of the 6 to 12-year-old life. However, peers and friendships become more and more important to the child in middle childhood.

## FRIENDSHIPS, PEERS, AND PEER GROUPS

Parent-child relationships are not the only significant relationships in a child's life. Friendships take on new importance as judges of one's worth, competence, and attractiveness. Friendships provide the opportunity for learning social skills such as how to communicate with others and how to negotiate differences. Children get ideas from one another about how to perform certain tasks, how to gain popularity, what to wear, say, and listen to, and how to act. This society of children marks a transition from a life focused on the family to a life concerned with peers. Peers play a key role in a child's self-esteem at this age as any parent who has tried to console a rejected child will tell you. No matter how complimentary and encouraging the parent may be, being rejected by friends can only be remedied by renewed acceptance (Lumen Learning, n.d.).



Figure 12.15: Peers influence a child's self-esteem. (Image by Robins Air Force Base is in the public domain)

Children's conceptualization of what makes someone a "friend" changes from a more egocentric understanding to one based on mutual trust and commitment. Both Bigelow (1977) and Selman (1980) (as cited by Paris, Ricardo, Raymond, & Johnson, 2021) believe that these changes are linked to advances in cognitive development. Bigelow and La Gaipa (1975, as cited in Lumen Learning, n.d.)) outline three stages to children's conceptualization of friendship .

**Table 12.1: Three Stages to Children's Conceptualization of Friendship**

| STAGE | DESCRIPTIONS |
| --- | --- |
| Stage One | In **stage one, reward-cost**, friendship focuses on mutual activities. Children in early, middle, and late childhood. |
| Stage Two | In **stage two, normative expectation,** focuses on conventional morality; that is, the emphasis is on a friend as someone who is kind and shares with you. Clark and Bittle (1992) found that fifth graders emphasized this in a friend more than third or eighth graders. |
| Stage Three | In **stage three, empathy and understanding,** friends are people who are loyal, committed to the relationship, and share intimate information. Clark and Bittle (1992) reported eighth graders emphasized this more in a friend. They also found that as early as fifth grade, girls were starting to include the sharing of secrets and not betraying confidences as crucial to someone who is a friend. |

Table 12.1: Three Stages to Children's Conceptualization of Friendship (Lifespan Development – Module 6: Middle Childhood by Lumen Learning references Psyc 200 Lifespan Psychology by Laura Overstreet, licensed under CC BY 4.0)

Friendships are very important for children. The social interaction with another child who is similar in age, skills, and knowledge provokes the development of many social skills that are valuable for the rest of life (Bukowski, Buhrmester, & Underwood, 2011, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). In these relationships, children learn how to initiate and maintain social interactions with other children. They learn skills for managing conflict, such as turn-taking, compromise, and bargaining. Play also involves the mutual, sometimes complex, coordination of goals, actions, and understanding. Through these experiences, children

develop friendships that provide additional sources of security and support to those provided by their parents (Lally & Valentine-French, 2019).

## FIVE STAGES OF FRIENDSHIP FROM EARLY CHILDHOOD THROUGH ADULTHOOD

Selman (1980, as cited by Lally & Valentine-French, 2019) outlines five stages of friendship from early childhood through to adulthood:

- In stage 0, **momentary physical interaction**, *a friend is someone who you are playing with at this point in time.* Selman notes that this is typical of children between the ages of three and six. These early friendships are based more on circumstances (e.g., a neighbour) than on genuine similarities.

- In stage 1, **one-way assistance**, *a friend is someone who does nice things for you,* such as saving you a seat on the school bus or sharing a toy. However, children in this stage, do not always think about what they are contributing to the relationships. Nonetheless, having a friend is important and children will sometimes put up with a not so nice friend, just to have a friend. Children as young as five and as old as nine may be in this stage.

- In stage 2, **fair-weather cooperation**, children are very concerned with fairness and reciprocity, and thus, *a friend is someone who returns a favour*. In this stage, if a child does something nice for a friend there is an expectation that the friend will do something nice for them at the first available opportunity. When this fails to happen, a child may break off the friendship. Selman found that some children as young as seven and as old as twelve are in this stage.

- In stage 3, **intimate and mutual sharing**, typically between the ages of eight and fifteen, *a friend is someone who you can tell them things you would tell no one else*. Children and teens in this stage no longer "keep score," and do things for a friend because they genuinely care for the person. If a friendship dissolves in this stage it is usually due to a violation of trust. However, children in this stage do expect their friend to share similar interests and viewpoints and may take it as a betrayal if a friend likes someone that they do not.

- In stage 4, **autonomous interdependence,** *a friend is someone who accepts you and that you accept as they are*. In this stage children, teens, and adults accept and even appreciate differences between themselves and their friends. They are also not as possessive, so they are less likely to feel threatened if their friends have other relationships or interests. Children are typically twelve or older in this stage.

## PEER GROUPS

Peer relationships can be challenging as well as supportive (Rubin, Coplan, Chen, Bowker, & McDonald, 2011, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Being accepted by other children is an important source of affirmation and self-esteem, but peer rejection can foreshadow later behaviour problems (especially when children are rejected due to aggressive behaviour). With increasing age, children confront the challenges of bullying, peer victimization, and managing conformity pressures. Social comparison with peers is an important means by which children evaluate their skills, knowledge, and personal qualities, but it may cause them to feel that they do not measure up well against others. For example, a child who is not athletic may feel unworthy of their football-playing peers and revert to shy behaviour, isolating themselves and avoiding conversation. Conversely, an athlete who doesn't "get" Shakespeare may feel embarrassed and avoid reading altogether.

Figure 12.16: Social comparison with peers is an important means by which children evaluate their value. (Image by the U.S Army is in the public domain)

Also, with the approach of adolescence, peer relationships become focused on psychological intimacy, involving personal disclosure, vulnerability, and loyalty (or its betrayal)—which significantly affect a child's outlook on the world. Each of these aspects of peer relationships require developing very different social and emotional skills than those that emerge in parent-child relationships. They also illustrate the many ways that peer relationships influence the growth of personality and self-concept (Lally & Valentine-French, 2019).

## PEER RELATIONSHIPS

Most children want to be liked and accepted by their friends. Some popular children are nice and have good social skills. These popular-prosocial children tend to do well in school and are cooperative and friendly. Popular-antisocial children may gain popularity by acting tough or spreading rumours about others (Cillessen & Mayeux, 2004, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Rejected children are sometimes excluded because they are shy and withdrawn. The withdrawn-rejected children are easy targets for bullies because they are unlikely to retaliate when belittled (Boulton, 1999, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Other rejected children are ostracized because they are aggressive, loud, and confrontational. The aggressive-rejected children may be acting out of a feeling of insecurity. Unfortunately, their fear of rejection only leads to behaviour that brings further rejection from other children. Children who are not accepted are more likely to experience conflict, lack confidence, and have trouble adjusting.



Figure 12.17: Peer relationships are particularly important for children. They can be supportive but also challenging. Peer rejection may lead to behavioural problems later in life. (Image by tup wanders is licensed under CC BY 2.0)

Peer Relationships are studied using sociometric assessment (which measures attraction between members of a group). Children are asked to mention the three children they like to play with the most, and those they do not like to play with. The number of times a child is nominated for each of the two categories (like and do not like) is tabulated.

**Table 12.2: Categories in Peer Relationships**

| Category | Description |
| --- | --- |
| Popular | Receive many votes in the "like" category, and very few in the "do not like" category. |
| Rejected | Receive more unfavourable votes, and few favourable ones. |
| Controversial | Mentioned frequently in each category, with several children liking them and several children placing them in the do not like category. |
| Neglected | Rarely mentioned in either category. |
| Average | Have a few positive votes with very few negative ones. |
| Popular-prosocial | Are nice and have good social skills; tend to do well in school and are cooperative and friendly. |
| Popular-antisocial | May gain popularity by acting tough or spreading rumours about others. |
| Rejected-withdrawn | Are shy and withdrawn and are easy targets for bullies because they are unlikely to retaliate when belittled. |
| Rejected-aggressive | Are ostracized because they are aggressive, loud, and confrontational. They may be acting out of a feeling of insecurity. |

Table 12.2: Categories in Peer Relationships (Lifespan Development: A Psychological Perspective by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0)

Unfortunately for children who are rejected by their peers, their fear of rejection often leads to behavior that brings further rejection from other children. Children who are not accepted are more likely to experience conflict, lack confidence, and have trouble adjusting. (Klima & Repetti, 2008; Schwartz, Lansford, Dodge, Pettit, & Bates, 2014, as cited in Lally & Valentine-French, 2019).

## Indigenous Perspectives

For a child that lives in a First Nation (FN) community, peer relationships will differ from that of a child who lives in an urban setting where there may be a variety of choices. In small remote communities, they will not have as much selection regarding peer relationships. Some children might not have a choice regarding friendships.

During middle childhood, children start to spend less time with parents and more time with peers. Parents often find that they have to modify their approach to parenting to accommodate the child's growing independence. In small and/or remote FN communities, a child's peer may well be a cousin or another close relative due to a smaller population. This unique relationship is more like a sibling relationship. Other peers become like cousins. Much of their life from the time they are able to play outside alone, at school or at community functions is spent playing and exploring with peers that are more like cousins. There is a sense of safety on a FN community because everyone in the community watches out for the children. Children might gain independence at an earlier age than that of a child in a city or bigger urban setting. Often, the parents of their peer/adopted cousin become aunties and uncles. They are very much a part of the child's life in regards to the roles that aunties and uncles play as mentioned in a comment from a previous chapter; they are the disciplinarian. Parenting styles are very different in FN communities. In large family structures, the older siblings are given the task of helping to rear their younger siblings.

## AGGRESSION, ANTISOCIAL BEHAVIOUR, BULLIES AND VICTIMS

**Aggression and Antisocial Behaviour**

Aggression may be physical, verbal or emotional. Aggression is activated in large part by the amygdala and regulated by the prefrontal cortex.



Figure 12.18: This child is threatening with physical aggression. (Image by Philippe Put is licensed under CC BY 2.0)

Testosterone is associated with increased aggression in both males and females. Aggression can be caused by negative experiences and emotions, including frustration and pain. Heat has also been shown to increase aggressive behaviour. Psychologist Craig Anderson studied archival data and found the rate of violent crimes increases with temperature (Anderson, 2001). Finally, as predicted by principles of observational learning, research evidence makes it very clear that, on average, people who watch violent behaviour become more aggressive. Early, antisocial behaviour leads to befriending others who also engage in antisocial behaviour, which only perpetuates the downward cycle of aggression and wrongful acts (Lally & Valentine-French, 2019).

**Bullying and Victims**
According to the Government of Canada (2016), bullying is defined as "willful, repeated aggressive behaviour with negative intent used by a child to maintain power over another child". There are different types of bullying, including verbal bullying, which is saying or writing mean things, teasing, name-calling, taunting, threatening, or making inappropriate sexual comments. Social bullying, also referred to as relational bullying, involves spreading rumours, purposefully excluding someone from a group, or embarrassing someone on purpose. Physical bullying involves hurting a person's body or possessions.

A more recent form of bullying is cyberbullying, which involves electronic technology. Examples of cyberbullying include sending mean text messages or emails, creating fake profiles, and posting embarrassing pictures, videos or rumours on social networking sites. Children who experience cyberbullying have a harder time getting away from the behaviour because it can occur any time of day and without being in the presence of others.

Figure 12.19: Cyberbullying can be devastating for children. (Image on Pixabay)

**Those at Risk for Bullying**

Bullying can happen to anyone but some students are at an increased risk for being bullied, including lesbian, gay, bisexual, transgendered, queer, two spirit (LGBTQ2S) youth, those with disabilities, and those who are socially isolated. Additionally, those who are perceived as different, weak, less popular, overweight, or having low self-esteem, have a higher likelihood of being bullied.

**Those Who are More Likely to Bully**

Bullies are often thought of as having low self-esteem, and then bully others to feel better about themselves. Although this can occur, many bullies in fact have high levels of self-esteem. They possess considerable popularity and social power and have well-connected peer relationships. They do not lack self-esteem, and instead lack empathy for others. They like to dominate or be in charge of others.

**Bullied Children**

Unfortunately, most children do not let adults know that they are being bullied. Some fear retaliation from the bully, while others are too embarrassed to ask for help. Those who are socially isolated may not know who to ask for help or believe that no one would care or assist them if they did ask for assistance. Consequently, it is important for parents and teachers to know the warning signs that may indicate a child is being bullied. These include: unexplainable injuries, lost or destroyed possessions, changes in eating or sleeping patterns, declining school grades, not wanting to go to school, loss of friends, decreased self-esteem and/or self-destructive behaviours.

## Summary

In this chapter we looked at:

- Erikson's fourth stage of industry vs. Inferiority

- The role of the family and different forms of families

- Divorce and how it changes the family

- The importance of peers and friendships

- Children in peer groups and types of friendships

- Consequences of peer acceptance or rejection

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# Emotional Development in Middle Childhood

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**Chapter Objectives**

After this chapter, you should be able to:

- Describe the continuum of development of emotional skills during middle childhood

- Discuss Kohlberg's Stages of Moral Development

- Discuss childhood mental health issues

- Explain resilience

- Describe self-understanding, motivation self-efficacy in middle childhood

- Explain gender identity

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## INTRODUCTION

As children get older their experiences allow them to develop a more realistic understanding of themselves, including both their strengths and weaknesses. This developing self-concept is influenced by messages they receive from their peers, their family, other adults in their lives such as teachers and coaches, and the media.

## CONTINUUM OF DEVELOPMENT

The Continuum of Development identifies several root emotional skills that are emerging in children between 5 and 8 years of age. During these years, children are solidifying their self-concept, identity and self-esteem. They start to define themselves by comparing themselves to others and are becoming more aware of stereotypes. They are better able to recognize and understand complex emotions such as gratitude, jealousy and anxiety. They now have a variety of strategies for managing their emotions, such as self-talk, empathy and perspective-taking. They often take great pride in their work and their new-found abilities to persevere and solve problems (Ontario Ministry of Education, 2014a).

Between the ages of 9 and 12, improving metacognitive skills (the awareness of their own thought processes) enable children to understand their emotional selves. They are also better at anticipating future outcomes which allows them to be better prepared for managing emotional situations. However, tweens can still struggle to

manage their emotions if they feel overwhelmed by strong emotions such as frustration or by the demands of the situation (Ontario Ministry of Education, 2014a).

## Lawrence Kohlberg's Stages of Moral Development

Kohlberg (1963, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) built on the work of Piaget and was interested in finding out how our moral reasoning changes as we get older. He wanted to find out how people decide what is right and what is wrong. Just as Piaget believed that children's cognitive development follows specific patterns, Kohlberg (1984, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) argued that we learn our moral values through active thinking and reasoning, and that moral development follows a series of stages. Kohlberg's six stages are generally organized into three levels of moral reasoning. To study moral development, Kohlberg looked at how children (and adults) respond to moral dilemmas.

One of Kohlberg's best-known moral dilemmas is the Heinz dilemma: In Europe, a person was near death from a special kind of cancer. There was one drug that the doctors thought might save them. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make but the druggist was charging ten times what the drug cost them to make. The druggist paid $200 for the radium and charged $2,000 for a small dose of the drug. The sick person's spouse, Heinz, went to everyone they knew to borrow the money but they could only get together about $1,000, about half of what the drug cost. They told the druggist that their spouse was dying and asked them to sell it cheaper or let them pay later. But the druggist said: "No, I discovered the drug and I'm going to make money from it." Heinz got desperate and broke into the druggist store to steal the drug for their sick spouse. Should the person have done that? (Kohlberg, 1969, p. 379, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## Level One – Preconventional Morality

In stage one, moral reasoning is based on concepts of punishment. The child believes that if the consequence for an action is punishment, then the action was wrong. In the second stage, the child bases their thinking on self-interest and reward ("You scratch my back, I'll scratch yours"). The youngest subjects seemed to answer based on what would happen to the spouse as a result of the act. For example, they might say the spouse should not break into the pharmacy because the pharmacist might find them and beat them. Or they might say that the spouse should break in and steal the drug and the sick spouse will give them a big kiss. Right or wrong, both decisions were based on what would physically happen as a result of the act. This is a self-centered approach to moral decision-making. They called this most superficial understanding of right and wrong preconventional morality. Preconventional morality focuses on self-interest. Punishment is avoided and rewards are sought. Adults can also fall into these stages, particularly when they are under pressure.

## Level Two – Conventional Morality

Those tested who based their answers on what other people would think of the spouse as a result of the act were placed in Level Two. For instance, they might say the spouse should break into the store, then everyone would think they were being a good partner, or the spouse should not because it is against the law. In either case,

right and wrong is determined by what other people think. In stage three, the person wants to please others. At stage four, the person acknowledges the importance of social norms or laws and wants to be a good member of the group or society. A good decision is one that gains the approval of others or one that complies with the law. This is called conventional morality; people care about the effect of their actions on others. Some older children, adolescents, and adults use this reasoning.

Level Three, post-conventional morality, is not included because it focuses on adolescence and adulthood. However, it is in the table below if you'd like an overview of Level Three – Stages 5 and 6.

**Preconventional Morality (young children)**

| Stage | Description |
| --- | --- |
| Stage 1 | Focus is on self-interest and punishment is avoided. The person shouldn't steal the drug, as they may get caught and go to jail. |
| Stage 2 | Rewards are sought. A person at this level will argue that the person should steal the drug because they do not want to lose their partner who takes care of them. |

**Conventional Morality (older children, adolescents, most adults)**

| Stage | Description |
| --- | --- |
| Stage 3 | Focus is on how situational outcomes impact others and wanting to please and be accepted. The person should steal the drug because that is what good partners do. |
| Stage 4 | People make decisions based on laws or formalized rules. The person should obey the law because stealing is a crime. |

**Post Conventional Morality (rare in adolescents, a few adults)**

| Stage | Description |
| --- | --- |
| Stage 5 | Individuals employ abstract reasoning to justify behaviours. The person should steal the drug because laws can be unjust and you have to consider the whole situation. |
| Stage 6 | Moral behaviour is based on self-chosen ethical principles. The person should steal the drug because life is more important than property. |

Although research has supported Kohlberg's idea that moral reasoning changes from an early emphasis on punishment and social rules and regulations to an emphasis on more general ethical principles, as with Piaget's approach, Kohlberg's stage model is probably too simple. For one, people may use higher levels of reasoning for some types of problems but revert to lower levels in situations where doing so is more consistent with their goals or beliefs (Rest, 1979, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Second, it has been argued that the stage model is particularly appropriate for Western, rather than non-Western, samples in which allegiance to social norms, such as respect for authority, may be particularly important (Haidt, 2001). In addition, there is frequently little correlation between how we score on the moral stages and how we behave in real life. Finally, critics of Kohlberg's theory believe that it is gender-biased. Typical male approaches to making a moral decision are given a higher rating (Level 4) than typical female approaches (Level 3). Males tend to make moral decisions

based on principles of law and order. Females tend to make moral decisions based on interpersonal interactions. Critics say that one approach is not better or worse than the other, just different.

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**Indigenous Perspectives**

In many Indigenous nations children learn the Seven Grandfather Teachings which are values and they are taught morals through Storytelling. In the story, one or more of the animals learns a valuable lesson. The child sees himself in the animal characters of the story.

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## SELF UNDERSTANDING

Children in middle childhood have a more realistic sense of self than do those in early childhood. That exaggerated sense of self as "biggest" or "smartest" or "tallest" gives way to an understanding of one's strengths and weaknesses. This can be attributed to greater experience in comparing one's own performance with that of others and to greater cognitive flexibility. A child's self-concept can be influenced by peers and family and the messages they send about a child's worth. Contemporary children also receive messages from the media about how they should look and act. Movies, music videos, the internet, and advertisers can all create cultural images of what is desirable or undesirable and this too can influence a child's self-concept.



Figure 17.1: Interactions with the media influence children's perception of themselves. (Image by Lucélia Ribeiro is licensed under CC BY-SA 2.0)

Young children begin developing social understanding very early in life and are also able to include other peoples' appraisals of them into their self-concept, including parents, teachers, peers, culture, and media. Internalizing others' appraisals and creating social comparison affect children's self-esteem, which is defined as an evaluation of one's identity. Children can have individual assessments of how well they perform a variety of activities and also develop an overall, global self-assessment. If there is a discrepancy between how children view themselves and what they consider to be their ideal selves, their self-esteem can be negatively affected.

Self-concept refers to beliefs about general personal identity (Seiffert, 2011, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). These beliefs include personal attributes, such as one's age, physical characteristics, behaviours, and competencies. Children in middle and late childhood have a more realistic sense of self than do those in early childhood, and they better understand their strengths and weaknesses. This can be attributed to greater experience in comparing their own performance with that of others, and to greater cognitive flexibility.

Another important development in self-understanding is self-efficacy, which is the belief that you are capable of carrying out a specific task or of reaching a specific goal (Bandura, 1977, 1986, 1997, as cited in Paris,

Ricardo, Raymond, & Johnson, 2021). Large discrepancies between self-efficacy and ability can create motivational problems for the individual (Seifert, 2011, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). If a student believes that they can solve mathematical problems, then the student is more likely to attempt the mathematics homework that the teacher assigns.

Unfortunately, the converse is also true. If a student believes that they are incapable of math, then the student is less likely to attempt the math homework regardless of the student's actual ability in math. Since self-efficacy is self-constructed, it is possible for students to miscalculate or misperceive their true skill, and these misperceptions can have complex effects on students' motivations. It is possible to have either too much or too little self-efficacy, and according to Bandura (1997, as cited in Paris, Ricardo, Raymond, & Johnson, 2021) the optimal level seems to be either at, or slightly above, true ability.



Figure 17.2: Families can support children's social and emotional skills. (Image is in the public domain)

As we have seen, children's experience of relationships at home and the peer group contributes to an expanding repertoire of social and emotional skills and also to broadened social understanding. In these relationships, children develop expectations for specific people, understanding of how to interact with adults and peers, and self-concept based on how others respond to them. These relationships are also significant forums for emotional development (Thompson, n.d.).

## CHILDHOOD MENTAL HEALTH

**Mental health** problems can disrupt daily life at home, at school or in the community. Without help, mental health problems can lead to school failure, alcohol or other drug abuse, family discord, violence or even suicide. However, help is available. Talk to your health care provider if you have concerns about your child's behaviour.

Mental health disorders are diagnosed by a qualified professional using the Diagnostic and Statistical Manual of Mental Disorders (DSM). This is a manual that is used as a standard across the profession for diagnosing and treating mental disorders.

**When You Have a Concern About a Child. What's in a Label?**

Children are continually evaluated as they enter and progress through school. If a child is showing a need, they should be assessed by a qualified professional who would make a recommendation or diagnosis of the child and give the type of instruction, resources, accommodations, and support that they should receive.

Ideally, a proper diagnosis or label is extremely beneficial for children who have educational, social, emotional, or developmental needs. Once their difficulty, disorder, or disability is labeled then the child will receive the help they need from parents, educators and any other professionals who will work as a team to meet the student's individual goals and needs.

However, it's important to consider that children that are labeled without proper support and accommodations or worse they may be misdiagnosed will have negative consequences. A label can also influence the child's self-concept, for example, if a child is misdiagnosed as having a learning disability; the child, teachers, and family member interpret their actions through the lens of that label. Labels are powerful and can be good for the child or they can go detrimental for their development all depending on the accuracy of the label and if they are accurately applied.

A team of people who include parents, teachers, and any other support staff will look at the child's evaluation assessment in a process called an Individual Education Plan (IEP). The team will discuss the diagnosis, recommendations, and the accommodations or help and a decisions will be made regarding what is the best for the child. This is time when parents or caregivers decide if they would like to follow this plan or they can dispute any part of the process. During an IEP, the team is able to voice concerns and questions. Most parents feel empowered when they leave these meetings. They feel as if they are a part of the team and that they know what, when, why, and how their child will be helped.

## CHILDHOOD MENTAL HEALTH DISORDERS

### SOCIAL AND EMOTIONAL DISORDERS

- Phobias
- Anxiety
- Post-Traumatic Stress Disorder – PTSD
- Obsessive Compulsive Disorder- OCD
- Depression

### DEVELOPMENTAL DISORDERS

- Autism Spectrum Disorder (ASD)
- Attention Deficit Disorder (ADHD)
- Pervasive Developmental Disorder (PDD)

### PHOBIAS

When a child who has a **phobia**(an extreme or irrational fear of or aversion to something which is out of

proportion to the risk it presents) is exposed to the phobic stimulus (the stimuli varies), it almost invariably provokes an immediate anxiety response, which may take the form of a situational bound or situational predisposed panic attack. Children can show effects and characteristics when it comes to specific phobias. The effects of anxiety show up by crying, throwing tantrums, experiencing freezing, or clinging to the parent that they have the most connection with. Related conditions include anxiety. Common childhood phobias include a fear of certain animals and insects, a fear of blood and a fear of needles.

## ANXIETY

Many children have fears and worries, and will feel sad and hopeless from time to time. Strong fears will appear at different times during development. For example, toddlers are often very distressed about being away from their parents, even if they are safe and cared for. Although fears and worries are typical in children, persistent or extreme forms of fear and sadness feelings could be due to anxiety or depression. Because the symptoms primarily involve thoughts and feelings, they are called **internalizing disorders**.



Figure 17.3: An anxious child (Photo by Zika Radosavljevic on Unsplash)

When children do not outgrow the fears and worries that are typical in young children, or when there are so many fears and worries that interfere with school, home, or play activities, the child may be diagnosed with an anxiety disorder.

Examples of different types of anxiety disorders include:

- Being very afraid when away from parents (separation anxiety)
- Having extreme fear about a specific thing or situation, such as dogs, insects, or going to the doctor (phobias)
- Being very afraid of school and other places where there are people (social anxiety)
- Being very worried about the future and about bad things happening (general anxiety)
- Having repeated episodes of sudden, unexpected, intense fear that come with symptoms like heart pounding, having trouble breathing, or feeling dizzy, shaky, or sweaty (panic disorder)

Anxiety may present as fear or worry, but can also make children irritable and angry. Anxiety symptoms can also include trouble sleeping, as well as physical symptoms like fatigue, headaches, or stomachaches. Some anxious children keep their worries to themselves and, thus, the symptoms can be missed. Related conditions include Obsessive-Compulsive Disorder and Post Traumatic Stress Disorder.

## POST-TRAUMATIC STRESS DISORDER (PTSD)

Exposure to traumatic events such as actual or threatened death, serious injury or sexual violation can have major developmental influences on children. While the majority of children will not develop PTSD after a trauma, best estimates from the literature are that around a third of them will, higher than adult estimates. Some reasons for this could include more limited knowledge about the world, differential coping mechanisms employed, and the fact that children's reactions to trauma are often highly influenced by how their parents and caregivers react.

The impact of PTSD on children weeks after a trauma, show that up to 90% of children may experience heightened physiological arousal, diffuse anxiety, survivor guilt, and emotional liability. These are all normal reactions and should be understood as such (similar things are seen in adults). Those children still having these symptoms three or four months after a disaster, however, may be in need of further assessment, particularly if they show the following symptoms as well. For older children, warning signs of problematic adjustment include: repetitious play reenacting a part of the disaster; preoccupation with danger or expressed concerns about safety; sleep disturbances and irritability; anger outbursts or aggressiveness; excessive worry about family or friends; school avoidance, particularly involving somatic complaints; behaviours characteristic of younger children; and changes in personality, withdrawal, and loss of interest in activities.

## OBSESSIVE COMPULSIVE DISORDER (OCD)

Although a diagnosis of OCD requires only that a person either has obsessions or compulsions, not both, approximately 96% of people experience both. For almost all people with OCD, being exposed to a certain stimuli (internal or external) will then trigger an upsetting or anxiety-causing obsession, which can only be relieved by doing a compulsion. For example, a person touches a doorknob in a public building, which causes an obsessive thought that they will get sick from the germs, which can only be relieved by compulsively washing their hands to an excessive degree. Some of the most common obsessions include unwanted thoughts of harming loved ones, persistent doubts that one has not locked doors or switched off electrical appliances, intrusive thoughts of being contaminated, and morally or sexually repugnant.

## DEPRESSION

Occasionally being sad or feeling hopeless is a part of every child's life. However, some children feel sad or uninterested in things that they used to enjoy, or feel helpless or hopeless in situations where they could do something to address the situations. When children feel persistent sadness and hopelessness, they may be diagnosed with depression.

Figure 17.4: Persistent sadness is a symptom of depression. (Photo by Zhivko Minkov on Unsplash)

## SYMPTOMS

We now know that youth who have depression may show signs that are slightly different from the typical adult symptoms of depression. Children who are depressed may complain of feeling sick, refuse to go to school, cling to a parent or caregiver, feel unloved, hopelessness about the future, or worry excessively that a parent may die. Older children and teens may sulk, get into trouble at school, be negative or grouchy, are irritable, indecisive, have trouble concentrating, or feel misunderstood. Because normal behaviours vary from one childhood stage to another, it can be difficult to tell whether a child who shows changes in behaviour is just going through a temporary "phase" or is suffering from depression.

## TREATMENT

With medication, psychotherapy, or combined treatment, most youth with depression can be effectively treated. Youth are more likely to respond to treatment if they receive it early in the course of their illness.

## MOTIVATION AS SELF EFFICACY

In addition to being influenced by their goals, interests, and attributions, students' motives are affected by specific beliefs about the student's personal capacities. In self-efficacy theory the beliefs become a primary, explicit explanation for motivation (Bandura, 1977, 1986, 1997). Self-efficacy is the belief that you are capable of carrying out a specific task or of reaching a specific goal. As mentioned previously, the optimal level seems to be either at or slightly above true capacity (Bandura, 1997, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). As we indicate below, large discrepancies between self-efficacy and ability can create motivational problems for the individual.

## MOTIVATION

Motivation refers to a desire, need, or drive that contributes to and explains behavioural changes. In general, motivators provide some sort of incentive for completing a task. One definition of a motivator explains it as a force

"acting either on or within a person to initiate behaviour." In addition to biological motives, motivations can be either intrinsic (arising from internal factors) or extrinsic (arising from external factors).

## EXTRINSIC VS. INTRINSIC MOTIVATION

Intrinsically motivated behaviours are performed because of the sense of personal satisfaction that they bring. According to Deci (1971, as cited in Paris, Ricardo, Raymond, & Johnson, 2021), these behaviours are defined as ones for which the reward is the satisfaction of performing the activity itself. Intrinsic motivation thus represents engagement in an activity for its own sake. For example, if comforting a friend makes a child feel good, they are intrinsically motivated to respond to their friend's distress.

Extrinsically motivated behaviours, on the other hand, are performed in order to receive something from others or avoid certain negative outcomes. The extrinsic motivator is outside of, and acts on, the individual. Rewards—such as a sticker, or candy—are good examples of extrinsic motivators. Social and emotional incentives like praise and attention are also extrinsic motivators since they are bestowed on the individual by another person.

In general, intrinsic motivation tends to be more long-lasting and can increase the desire to learn. Extrinsic motivation is more fleeting, only lasting as long as the reward is offered.



Figure 17.5: A lollipop can be an extrinsic motivator. (Image by strausadolf on Pixabay)

## LEARNED HELPLESSNESS AND SELF-EFFICACY

If a person's sense of self-efficacy is very low, they can develop learned helplessness, a perception of complete lack of control in mastering a task. The attitude is similar to depression, a pervasive feeling of apathy and a belief that effort makes no difference and does not lead to success. Learned helplessness was originally studied from the behaviourist perspective of classical and operant conditioning by the psychologist Martin Seligman (1995, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). In people, learned helplessness leads to characteristic ways of dealing with problems. They tend to attribute the source of a problem to themselves, to generalize the problem to many aspects of life, and to see the problem as lasting or permanent. More resilient individuals, in contrast, are more likely to attribute a problem to outside sources, to see it as specific to a particular situation or activity, and to see it as temporary or time-limited. Consider, for example, two students who each fail a test. The one with a lot of learned helplessness is more likely to explain the failure by saying something like: "I'm stupid; I never perform well on any schoolwork, and I never will perform well at it." The other, more resilient student is more likely to say something like: "The teacher made the test too hard this time, so the test doesn't prove anything about how I will do next time or in other subjects."

Figure 17.6: If this child thinks that studying won't help them do well on the test, then low self-efficacy may develop into learned helplessness. (Image by amenclinicsphotos ac is licensed under CC BY-SA 2.0)

What is noteworthy about these differences in perception is how much the more resilient of these perspectives resembles high self-efficacy and how much learned helplessness seems to contradict or differ from it. As already noted, high self-efficacy is a strong belief in one's capacity to carry out a specific task successfully. By definition, therefore, self-efficacy focuses attention on a temporary or time-limited activity (the task), even though the cause of successful completion (oneself) is "internal."

## RESILIENCE

Resilient children have developed internal processes that enable them to cope with challenges. Children who haven't yet developed these processes are sometimes mis-labelled as lacking in self-control. Resilience stems from self-regulation, not self-control. Resilient children know what their stressors are, can recognize signs they are becoming over-stressed, and have strategies for reducing stress. Resiliency is not static; it is not unusual for a child to be able to cope with set-backs in some situations but not in others. According toHow Does Learning Happen?: "Educators can play an important role in supporting self-regulation by providing environments that reduce stressors while recognizing and supporting children's efforts and increasing ability to self-regulate. Educators can also support children's developing ability to self-regulate by being responsive and attuned to children's individual cues, arousal states, and responses to various stressors. And they can help children learn strategies for becoming or staying calm and focused by enabling them to recognize and modulate their emotional states and impulses and become more aware of the effects of their actions on others." (Ontario Ministry of Education, 2014b)

Ontario's foundational document, The Kindergarten Program (2016), builds on the concepts set out in How Does Learning Happen?. According to this document, children's ability to self-regulate "is essential to the development of learning skills and work habits". A play-based kindergarten learning environment supports children's emerging ability to self-regulate by, for example, providing a variety of activities and spaces within the classroom to help children learn how choose between stimulating or calming ones and by modelling of self-regulation strategies by the classroom educators (Ontario Ministry of Education, 2016). Development of self-regulation skills continues through middle childhood.

Dr. Stuart Shanker has identified five domains of self-regulation:

- **Biological:** the ability to control one's level of energy to match the situation
- **Emotional:** the ability to modify intense emotional responses

- **Cognitive:** the ability to stay focused and ignore distractions
- **Social:** the ability to respond appropriately to social cues
- **Prosocial:** the ability to empathize (Shanker, 2021).

## GENDER IDENTITY

The development of gender and gender identity is likewise an interaction among social, biological, and representational influences (Ruble, Martin, & Berenbaum, 2006, as cited by Paris, Ricardo, Raymond, & Johnson, 2021). Young children learn about gender from parents, peers, and others in society, and develop their own conceptions of the attributes associated with maleness or femaleness (called gender schemas). They also negotiate biological transitions (such as puberty) that cause their sense of themselves and their sexual identity to mature.
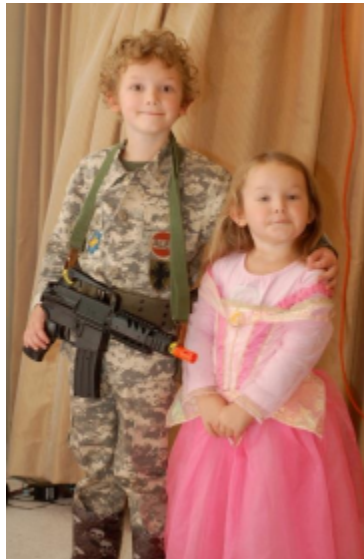


Figure 17.7: Social influences such as cultural norms impact children's interests, dress, style of speech and even life aspirations.

(Image by Amanda Westmont is licensed under CC BY-NC-SA 2.0)

Each of these examples of the growth of social and emotional competence illustrates not only the interaction of social, biological, and representational influences but also how their development unfolds over an extended period. Early influences are important, but not determinative because the capabilities required for mature moral conduct, gender identity, and other outcomes continue to develop throughout childhood, adolescence, and even the adult years.

As the preceding sentence suggests, social and personality development continues through adolescence and the adult years, and it is influenced by the same constellation of social, biological, and representational influences discussed for childhood. Changing social relationships and roles, biological maturation and how the individual represents both experience and the self, continue to form the bases for development throughout life. In this respect, when an adult looks forward rather than retrospectively to ask, "What kind of person am I becoming?"—A similarly fascinating, complex, multifaceted interaction of developmental processes lies ahead (Thompson, 2022).

Summary

In this chapter we looked at:

- The continuum of development of emotional skills during middle childhood

- Kohlberg's stages of moral development

- childhood mental health issues

- How school-age children continue to develop their self-understanding

- Self-efficacy and learned helplessness

- Resilience

- Gender identification

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**CHAPTER 18**

## *Communication, Language and Literacy Development in Middle Childhood*

Chapter Objectives

After this chapter, you should be able to identify:

- Branches of linguistics
- The process of learning to read
- Challenges in learning to read and write
- The influences of digital technology on communication, language and literacy

### INTRODUCTION

In the middle years communication, language and literacy skills continue to develop. Children become skilled communicators, using both verbal and non-verbal communication. They use fluent and grammatically correct speech including correct verb tenses, word order and sentence structure. Their vocabulary continues to expand to include subject specific terminology, synonyms and local slang. They increase the length of recalled stories, tell jokes and adapt their communication to meet the needs of their listeners and communication partners. During this period of development phonological awareness supports their ability to read and write. Most children successfully adopt a variety of strategies to support them to read fluently and for meaning. As readers, they read for pleasure, to seek information and for other purposes and can think critically about the content they are reading. Equally during this period of development children are writing with increasing complexity, and writing in different forms, adapting their writing to suit the audience, (Ontario Ministry of Education, 2014)

### INTRODUCTION TO LINGUISTICS

Human language is such a complex topic that there is an entire field, linguistics, devoted to its study. Linguistics views language in an objective way, using the scientific method and rigorous research to form theories about how humans acquire, use, and sometimes abuse language. There are a few major branches of linguistics, which it is useful to understand in order to learn about language from a psychological perspective.

## MAJOR BRANCHES OF LINGUISTICS

This diagram outlines the various subfields of linguistics, the study of language. These include phonetics, phonology, morphology, syntax, semantics, and pragmatics.
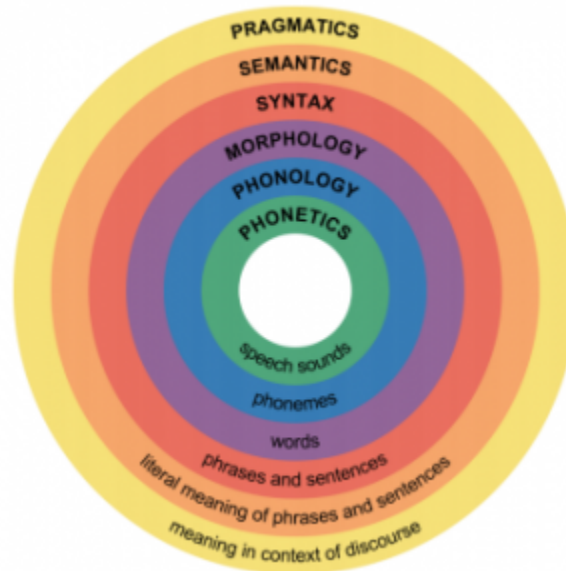


Figure 18.1: Major branches of linguistics (Image is in the public domain)

## PHONETICS AND PHONOLOGY

A phoneme is the smallest unit of sound that makes a meaningful difference in a language. The word "bit" has three phonemes, /b/, /i/, and /t/ (in transcription, phonemes are placed between slashes), and the word "pit" also has three: /p/, /i/, and /t/. In spoken languages, phonemes are produced by the positions and movements of the vocal tract, including our lips, teeth, tongue, vocal cords, and throat, whereas in sign languages phonemes are defined by the shapes and movement of the hands. English contains about 45 phonemes.

Graphemes are written symbols that represent sounds (phonemes). There are approximately 250 graphemes in the English language. Graphemes can be a single letter or a combination of letters. For example, the word "bead" has 3 phonemes b/ea/d. "Ea" is a grapheme; two letters that represent the sound of a long "e" when writing the word "bead".

Whereas phonemes are the smallest units of sound in language, phonetics is the study of individual speech sounds; phonology is the study of phonemes, which are the speech sounds of an individual language. These two heavily overlapping subfields cover all the sounds that humans can make, as well as which sounds make up different languages.

## MORPHEME AND MORPHOLOGY

A morpheme is a string of one or more phonemes that makes up the smallest units of meaning in a language. Some morphemes, such as one-letter words like "I" and "a," are also phonemes, but most morphemes are made up of combinations of phonemes. Some morphemes are prefixes and suffixes used to modify other words. For example, the syllable "re-" as in "rewrite" or "repay" means "to do again," and the suffix "-est" as in "happiest" or "coolest" means "to the maximum."

Morphology is the study of words and other meaningful units of language like suffixes and prefixes. A morphologist would be interested in the relationship between words like "dog" and "dogs" or "walk" and "walking," and how people figure out the differences between those words.

## SYNTAX

Syntax is the set of rules of a language by which we construct sentences. Each language has a different syntax. The syntax of the English language requires that each sentence have a noun and a verb, each of which may be modified by adjectives and adverbs. Some syntaxes make use of the order in which words appear, while others do not.

Syntax is the study of sentences and phrases, or how people put words into the right order so that they can communicate meaningfully. All languages have underlying rules of syntax, which, along with morphological rules, make up every language's grammar. An example of syntax coming into play in language is "Eugene walked the dog" versus "The dog walked Eugene." The order of words is not arbitrary—in order for the sentence to convey the intended meaning, the words must be in a certain order.

## SEMANTICS AND PRAGMATICS

Semantics, generally, is about the meaning of sentences. Someone who studies semantics is interested in words and what real-world object or concept those words denote, or point to.

Pragmatics is an even broader field that studies how the context of a sentence contributes to meaning. For example, someone shouting "Fire!" has a very different meaning if they are in charge of a seven-gun salute than it does if they are sitting in a crowded movie theater. Every language is different. In English, an adjective comes before a noun ("red house"), whereas in Spanish, the adjective comes after ("casa [house] roja [red].") In German, you can put noun after noun together to form giant compound words; in Chinese, the pitch of your voice determines the meaning of your words. in American Sign Language, you can convey full, grammatical sentences with tense and aspect by moving your hands and face. But all languages have structural underpinnings that make them logical for the people who speak and understand them (OER Services, n.d.).



Figure 18.2: As speakers of Chinese, these children would understand the importance of pitch. (Image by joan vila is licensed under CC BY 2.0)

## COGNITIVE LANGUAGE AND COMMUNICATION

When learning one or more languages in middle childhood, children are able to understand that there are many

complex parts including comprehension, fluency, and meaning when communicating. The following are areas of cognitive language and communication.

## LEXICON

Every language has its rules, which act as a framework for meaningful communication. But what do people fill that framework up with? The answer is, of course, words. Every human language has a lexicon—the sum total of all of the words in that language. By using grammatical rules to combine words into logical sentences, humans can convey an infinite number of concepts.

## GRAMMAR

Because all language obeys a set of combinatory rules, we can communicate an infinite number of concepts. While every language has a different set of rules, all languages do obey rules. These rules are known as grammar. Speakers of a language have internalized the rules and exceptions for that language's grammar. There are rules for every level of language—word formation (for example, native speakers of English have internalized the general rule that -ed is the ending for past-tense verbs, so even when they encounter a brand-new verb, they automatically know how to put it into past tense); phrase formation (for example, knowing that when you use the verb "buy," it needs a subject and an object; "they buys" is wrong, but "they buys a gift" is okay); and sentence formation.

Older children are also able to learn new rules of grammar with more flexibility. While younger children are likely to be reluctant to give up saying "I goed there", older children will learn this rather quickly along with other rules of grammar.

## VOCABULARY

One of the reasons that children can classify objects in so many ways is that they have acquired a vocabulary to do so. By fifth grade, a child's vocabulary has grown to 40,000 words. It grows at a rate that exceeds that of those in early childhood. This language explosion, however, differs from that of younger children because it is facilitated by being able to associate new words with those already known, and because it is accompanied by a more sophisticated understanding of the meanings of a word.

## CONTEXT

Words do not possess fixed meanings but change their interpretation as a function of the context in which they are spoken. We use contextual information—the information surrounding language—to help us interpret it. Context is how everything within language works together to convey a particular meaning. Context includes tone of voice, body language, and the words being used. Depending on how a person says something, holds their body, or emphasizes certain points of a sentence, a variety of different messages can be conveyed. For example, the word "awesome," when said with a big smile, means the person is excited about a situation. "Awesome," said with crossed arms, rolled eyes, and a sarcastic tone, means the person is not thrilled with the situation (OER Services, n.d.).
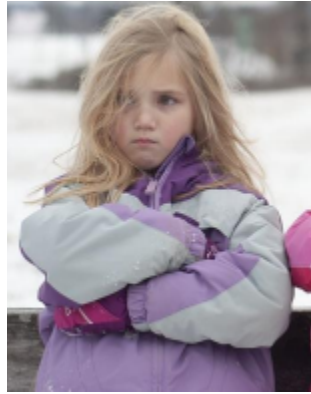
Figure 18.3: Context helps us understand meaning. (Image is licensed under CC0)

## NEW UNDERSTANDING

Those in middle and late childhood are also able to think of objects in less literal ways. For example, if asked for the first word that comes to mind when one hears the word "pizza", the younger child is likely to say "eat" or some word that describes what is done with a pizza. However, the older child is more likely to place pizza in the appropriate category and say "food". This sophistication of vocabulary is also evidenced by the fact that older children tell jokes and delight in doing so. They may use jokes that involve plays on words such as "knock-knock" jokes or jokes with punch lines. Young children do not understand play on words and tell "jokes" that are literal or slapstick, such as "A person fell down in the mud! Isn't that funny?" (Lumen Learning, n.d.).

## LEARNING TO READ

A huge milestone in middle childhood is learning to read and write. While the foundations of this were laid in infancy and early childhood, formal instruction on this process usually happens during the school-age years. There isn't always complete agreement on how children are best taught to read. The following approaches to teaching reading are separated by their methodology, but today, models of reading strive for a balance between the two types of reading methods because they are both recognized as essential for learning to read.

- A phonics-based approach teaches reading by making sure children can understand letter-sound correspondences (how letters sound), automatically recognize familiar words, and decode unfamiliar words. This ability to break the code of reading allows children to read words they have never heard spoken before.
- The whole-language approach attempts to teach reading as naturally as possible. As the sounds of words don't have meaning, the focus is on reading words and sentences in context (such as real books), rather than learning the sounds and phonemes that makeup words.

## LEARNING DIFFICULTIES

When children don't seem to be developing or learning in the typical pattern one might be assessed for a disorder or disability. What is a learning disorder or disability? In the next section we'll learn about the spectrum of disorders and how they may impact many areas of the child's life.

A learning disorder is a classification of disorders in which a person has difficulty learning in a typical manner

within one of several domains. Types of learning disorders include difficulties in reading (dyslexia), mathematics (dyscalculia), and writing (dysgraphia). These disorders are diagnosed with certain criteria.

Children with learning challenges may learn differently in relationship to a a specific area, a specific task or a type of activity related to education.

Children with learning challenges are usually identified in school because this is when their academic abilities are being tested, compared, and measured. In the Diagnostic and Statistical Manual of Mental Disorders -DSM-5, a qualified person will make a diagnosis, identified causes, and will make a treatment plan for disorders and disabilities. The diagnosis of specific learning disorder was added to the DSM-5 in 2013.

The DSM does not require that a single domain of difficulty (such as reading, mathematics, or written expression) be identified—instead, it is a single diagnosis that describes a collection of potential difficulties with general academic skills, simply including detailed specifications for the areas of reading, mathematics, and writing. Academic performance must be below average in at least one of these fields, and the symptoms may also interfere with daily life or work. In addition, the learning difficulties cannot be attributed to other sensory, motor, developmental, or neurological disorders (Lally & Valentine-French, 2019). The following is an example of the DSM-5 – learning disorders.

## Learning Disorders

- Dyslexia – Reading
- Dyscalculia – Mathematics
- Dyspraxia – Motor Coordination

- Dysgraphia – Writing
- Auditory Processing Disorder – Hearing
- Visual Processing Disorder – Visual

## Speech and Language Disorders

- Aphasia – Loss of expressive and or receptive language

- Articulation Disorder – Distortions or substitutions in the production of speech sounds
- Fluency Disorders – Difficulty speaking in a flowing way
- Voice Disorders – differences in voice quality, pitch or loudness

## LEARNING DISORDERS OR DISABILITIES

## Dyslexia

Dyslexia, sometimes called "reading disorder," is the most common learning disability; of all students with specific learning disabilities, 70%–80% have deficits in reading. The term "developmental dyslexia" is often used as a catchall term, but researchers assert that dyslexia is just one of several types of reading disabilities. A reading

disability can affect any part of the reading process, including word recognition, word decoding, reading speed, prosody (oral reading with expression), and reading comprehension.

## Dyscalculia

Dyscalculia is a form of math-related disability that involves difficulties with learning math-related concepts (such as quantity, place value, and time), memorizing math-related facts, organizing numbers, and understanding how problems are organized on the page. Dyscalculics are often referred to as having poor "number sense."

## Dyspraxia

Children who have motor skills substantially below what is expected for their age are diagnosed with dyspraxia – or developmental coordination disorder (DCD) as it is more formally known. They are not lazy, clumsy or unintelligent – in fact, their intellectual ability is in line with the general population – but they do struggle with everyday tasks that require coordination.



Figure 18.4: Children with learning challenges are usually identified in school because this is when their academic abilities are being tested, compared, and measured. (Image by pan xiaozhen on Unsplash)

## Dysgraphia

The term dysgraphia is often used as an overarching term for all disorders of written expression. Individuals with dysgraphia typically show multiple writing-related deficiencies, such as grammatical and punctuation errors within sentences, poor paragraph organization, multiple spelling errors, and excessively poor penmanship.

## Auditory Processing Disorder

A processing deficit in the auditory modality that spans multiple processes is auditory processing disorder (APD). To date, APD diagnosis is mostly based on the utilization of speech material. Unfortunately, acceptable non-speech tests that allow differentiation between an actual central hearing disorder and related disorders such as specific language impairments are still not adequately available.

## Visual Processing Disorder

Difficulty processing or interpreting visual information is referred to as visual processing disorder (VPD). Kids with

visual processing issues may have difficulty telling the difference between two shapes or finding a specific piece of information on a page (Ludwig, Fuchs, Kruse, Uhlig, Kotz,  & Rübsamen, 2014).

**Table 18.1: Summary of Learning Disabilities**

| Disability | Difficulties | Effects |
| --- | --- | --- |
| Dyslexia | Difficulty with reading | Problems reading, writing, spelling |
| Dyscalculia | Difficulty with math | Problems doing math problems, understanding time, using money |
| Dyspraxia (Sensory Integration Disorder) | Difficulty with fine motor skills | Problems with hand-eye coordination, balance manual dexterity |
| Dysgraphia | Difficulty with writing | Problems with handwriting, spelling, organizing ideas |
| Auditory Processing Disorder | Difficulty hearing difference between sounds | Problems with reading, comprehension, language |
| Visual Processing Disorder | Difficulty interpreting visual information | Problems with reading, math, maps, charts, symbols, pictures |

Table 18.1- Summary of Learning Disabilities (Dyspraxi by The Conversation is licensed under CC BY-ND 4.0)

## SPEECH AND LANGUAGE DISORDERS

### Aphasia

A loss of the ability to produce or understand language is referred to as aphasia. Without the brain, there would be no language. The human brain has a few areas that are specific to language processing and production. When these areas are damaged or injured, capabilities for speaking or understanding can be lost, a disorder known as aphasia. These areas must function together in order for a person to develop, use, and understand language.

### Articulation Disorder

An articulation disorder refers to the inability to correctly produce speech sounds (phonemes) because of imprecise placement, timing, pressure, speed, or flow of movement of the lips, tongue, or throat (NIDCD, 2016, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Sounds can be substituted, left off, added or changed. These errors may make it hard for people to understand the speaker. They can range from problems with specific sounds, such as lisping to severe impairment in the phonological system. Most children have problems pronouncing words early on while their speech is developing. However, by age three, at least half of what a child says should be understood by a stranger. By age five, a child's speech should be mostly intelligible. Parents should seek help if by age six the child is still having trouble producing certain sounds. It should be noted that accents are not articulation disorders (Medline Plus, 2016a, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

### Fluency Disorders

**Fluency disorders** affect the rate of speech. Speech may be labored and slow, or too fast for listeners to follow. The most common fluency disorder is stuttering.

**Stuttering** is a speech disorder in which sounds, syllables, or words are repeated or last longer than normal. These problems cause a break in the flow of speech, which is called dysfluency (Medline Plus, 2016b, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). About 5% of young children, aged two-five, will develop some stuttering that

may last from several weeks to several years (Medline Plus, 2016c, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). Approximately 75% of children recover from stuttering. For the remaining 25%, stuttering can persist as a lifelong communication disorder (National Institute on Deafness and other Communication Disorders, NIDCD, 2016, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). This is called developmental stuttering and is the most common form of stuttering.

Brain injury, and in very rare instances, emotional trauma may be other triggers for developing problems with stuttering. In most cases of developmental stuttering, other family members share the same communication disorder. Researchers have recently identified variants in four genes that are more commonly found in those who stutter (NIDCD, 2016, as cited in Paris, Ricardo, Raymond, & Johnson, 2021).

## Voice Disorders

Disorders of the voice involve problems with pitch, loudness, and quality of the voice (American Speech-Language and Hearing Association, 2016, as cited in Paris, Ricardo, Raymond, & Johnson, 2021). It only becomes a disorder when problems with the voice make the child unintelligible. In children, voice disorders are significantly more prevalent in males than in females. Between 1.4% and 6% of children experience problems with the quality of their voice. Causes can be due to structural abnormalities in the vocal cords and/or larynx, functional factors, such as vocal fatigue from overuse, and in rarer cases psychological factors, such as chronic stress and anxiety (Lally & Valentine-French, 2019).



Figure 18.5: Speech therapy. (Image by EU Civil)

## DIGITAL TECHNOLOGY AND SCREENS

In recent years digital technology has profoundly changed the way we live and work. At work and in everyday life it is almost impossible to avoid engaging with screens. Almost everything we do involves some form of digital technology and contact with a screen from shopping and banking, to communicating with others as examples.

In this text we are concerned with children's development. How does digital technology including the use of screens influence children's development of language and literacy? This includes children's exposure to screens as well how screen use by others may impact them. In the past screens generally referred to television, but now the term is used to include computers, tablets and Smart phones. Media developers have been quick to respond to this demographic with programming and developing apps for the youngest viewers and users. There are hundreds of videos posted on You Tube and Tik Tok for example, created with young children in mind.

We now know that children are also affected by the screen use of others referred to as second hand screen time (The Conversation, 2020). Smart Phones have made it possible to connect with others almost anywhere and to access information at our fingertips. Digital technology has blurred boundaries between work and home life. For these reasons and more, parents and caregivers can be easily distracted by their phones. Distracted caregiving may negatively impact the quality of the relationship between a child and a primary caregiver. A child may come to believe that the content on the caregiver's phone is more important than they are. This inattention and lack of direct attention can have an adverse effect on communication and language development (The Conversation, 2020).

So how does this all affect children's brains and development? Since digital technology and the recent access to screens is fairly recent, researchers are still trying to determine the extent to which development is influenced and make recommendations (Canadian Paediatric Society, 2017). In 2017 the Canadian Paediatric Society surveyed its members and released a position statement on screen time for children. The position statement recommends that physicians counsel families on 4Ms: Minimizing screen time, mitigating the potential harmful effects of screen time, being mindful of screen time (children' and adults) and to model positive habits (Canadian Paediatric Society, n.d).

Klimova and Pikhart (2020), concluded that the use of Facebook has a positive effect on developing writing skills in English as a foreign language, especially in shaping and organizing ideas, enhancing motivation, developing and supporting collaboration among peers, improving vocabulary, and reducing students´ shyness. Social media has both positive and negative impacts on how people write and speak English. The demands for faster and convenient communication have increased the propensity to make spelling mistakes, use abbreviations, and improper use of informal language. New vocabulary coined in social media has also trickled down to daily verbal conversations. Some words that were slang have even been integrated into mainstream English making it simpler to understand (Flyextremeworld, 2022).

Dore, Logan, Lin, Purtel, & Justice (2020), determined that media use has a negative effect on literacy skills when it is used in large amounts on a daily basis and thus displaces important educational activities like shared book reading and other activities with a print focus. On the other hand, more moderate amounts of media use may be less likely to displace such activities or may not displace them to the extent that it disrupts literacy development.

## Summary

In this chapter we looked at:

- Branches of linguistics

- The process of learning to read

- Challenges in learning to read and write

- The influences of digital technology on communication, language and literacy

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