

Centre of Excellence for Early Childhood Development

Early Learning Prevents YOUTH VIOLENCE



Richard E. Tremblay
Jean Gervais
Amélie Petitclerc



CENTRES OF EXCELLENCE FOR CHILDREN'S WELL-BEING

Early Childhood Development

Early Learning Prevents Youth Violence

This report was prepared and issued by the Centre of Excellence for Early Childhood Development (CEECD - www.excellence-earlychildhood.ca), one of four Centres of Excellence for Children's Well-Being. The Centres of Excellence are funded by the Public Health Agency of Canada. Financial support was provided by the Canadian Council on Learning's Early Childhood Learning Knowledge Centre (ECLKC - www.ccl-cca.ca/childhoodlearning). The opinions expressed in this document are those of the authors or researchers and do not necessarily reflect the views of the Public Health agency of Canada and of the Canadian Council on Learning.

The structure and content of this report are based on the following documents:

Gervais J., Tremblay, R.E. (2008). *Aggression in young children: The Interactive Guide to Observe, Understand and Intervene*. Directed by Jean-Pierre Maher. Soon to be released from NFB-2008: www.nfb.ca.¹

Gervais J., Tremblay, R.E. (2005). *Origins of Human Aggression: The Other Story*. Directed by Jean-Pierre Maher. National Film Board of Canada www.nfb.ca.²

Tremblay, R. E. (2008). *Prévenir la violence dès la petite enfance*. Paris: Éditions Odile Jacob.³

Tremblay, R. E. (2008). *Anger and Aggression*. Encyclopedia of Infant and Early Childhood Development. M. M. Haith & J. B. Benson, Academic Press. 1-3.⁴

Tremblay, R. E., & Nagin, D. S. (2005). *The Developmental Origins of Physical Aggression in Humans*. In R. E. Tremblay, W. W. Hartup, & J. Archer (Eds.), *Developmental origins of aggression*. New York: Guilford Press.⁵

This publication is available electronically at:

www.excellence-earlychildhood.ca/documents/Tremblay_AggressionReport_ANG.pdf

For additional information, please contact:

Centre of Excellence for Early Childhood Development
GRIP - Université de Montréal
P.O. Box 6128, Centre-ville Stn., Montreal, Quebec, Canada H3C 3J7
Tel.: 514.343.6963 Fax.: 514.343.6962

All rights reserved. This publication can be reproduced in whole or in part with the written permission of the Centre of Excellence for Early Childhood Development. To gain this permission, please contact: enfant-child-encyclo@grip.umontreal.ca. These materials are to be used solely for non-commercial purposes. Reproductions in whole or in part must also include references to the original documents on which this report is based.

Cite this publication in the following format:

Tremblay, R. E., Gervais, J., Petitclerc, A., *Early childhood learning prevents youth violence*. Montreal, Quebec. Centre of Excellence for Early Childhood Development: 2008; 32 pages

Published in November 2008

Montreal, Quebec

ISBN 978-2-9810863-2-7

Aussi disponible en français sous le titre :

Prévenir la violence par l'apprentissage à la petite enfance

ISBN 978-2-9810863-0-3

Também disponível em português sob o título:

Prevenir a violência pelo aprendizado na primeira infância

ISBN 978-2-9810863-2-7



CENTRES OF EXCELLENCE FOR CHILDREN'S WELL-BEING

Early Childhood Development



CANADIAN COUNCIL
ON LEARNING

CONSEIL CANADIEN
SUR L'APPRENTISSAGE

EARLY CHILDHOOD LEARNING KNOWLEDGE CENTRE

TABLE OF CONTENTS

Introduction	2
Chapter 1	
Youth Aggression in Canada: Canadians' Beliefs about Youth Aggression.....	3
Chapter 2	
What is aggression?	4
Physical Aggression	4
Proactive vs. Reactive Aggression.....	4
Verbal Aggression	4
Indirect Aggression	4
Chapter 3	
The Natural Course of Human Aggression.....	4
Aggression in Infants	5
Aggression in Toddlers	5
Aggression in Preschool and School-Age Children	6
Skills Associated with Desistance of Physical Aggression.....	7
Development of Language	7
Play Fighting	7
Development of Social Skills	8
Chapter 4	
Consequences of Uncontrolled Aggressive Behaviour	8
Persistence of Aggressive Behaviour.....	8
Aggression and School Performance	9
Aggression Linked with Other Problems	10
Chapter 5	
Understanding Aggression	10
Sources of the Predisposition to Aggression	10
Species Heritage	10
Gender Heritage.....	11
Family Heritage	12
Intrauterine Environment.....	13
Temperament	13
Chapter 6	
Controlling Aggression	14
Observing	14
Intervening	15
Environmental Factors that Foster Development of Peaceful Interaction	15
Care that Fosters Development of Peaceful Interaction	17
Available Intervention Programs ...	20
For Infants, Toddlers and Preschoolers.....	20
For School-Age Children.....	21
Conclusions.....	22
References	25

INTRODUCTION

Public opinion research^{6, 7} has found that more than 60% of Canadians believe that the age group most likely to engage in physical aggression is adolescent boys aged 12 to 17. Only 2% thought of preschoolers.

In fact, those 2% have it right.

Children violently express anger soon after birth and are sufficiently well coordinated to hit, bite and kick before their first birthday. By the time children reach the age of three, they are capable of a wide range of acts of physical aggression. For most children, the use of aggression starts to decline after toddlerhood, as they learn to control their emotions, communicate through language, and express their frustrations in a more constructive way^{3, 4}.

Most children who are nurtured in a supportive environment, in which parents and other caregivers provide positive guidance, will follow this path toward socially appropriate behaviour. The preschool years are the critical time to teach children the fundamentals of social interaction—sharing and compromise, cooperation and verbal communication⁵.

Those who fail to learn these lessons early in life—about 5 to 10% of Canadian children—are more likely to run into serious trouble later, from difficulty at school and substance abuse to risk-taking, mental illness and criminal activity.

This report examines what we know about aggressive behaviour among our youngest citizens. Against the backdrop of recent research on childhood development, the evidence is growing clear: childhood aggression must be taken seriously.

WHY WAIT UNTIL IT'S TOO LATE?

- Canadians pay more than \$100,000 a year to keep an adolescent in detention⁹ while a university education in Canada costs \$12,000 a year on average⁸.
- A juvenile delinquent placed in residential care, compared to one that is not, is close to 40 times more likely to have a criminal record before he is 24¹⁰.
- Research has shown that each dollar invested in preschool prevention programs produce a \$7 benefit by the time the child is a young adult and a \$13 benefit by the time he is a mature adult¹¹.

Conclusion: Early prevention creates health, well-being and wealth!

Like most types of problems, aggression is best addressed early—and the earlier, the better. Even the youngest children can be taught to modulate their behaviour and share space with the rest of the world.

The research literature demonstrates that interventions with aggressive adolescents often substantially increase the likelihood of criminal behavior while interventions with at-risk preschool children have long term beneficial effects^{10, 12, 13}. However, the notion is not widely shared by the general public. In the public opinion survey cited above, 41% of respondents believed governments should invest more money in violence-prevention programs for adolescents, while only 10% would invest in programs for children aged four and under^{6, 7}.

This report pulls together what we know so far about the causes and consequences of childhood aggression, and what

parents, caregivers, educators and society as a whole ought to do about it.

WHAT IS AGGRESSIVE BEHAVIOUR?

Physical aggression: hitting, slapping, kicking, biting, pushing, grabbing, pulling, shoving, beating, limb twisting, etc.

Verbal aggression: use of hostile words to insult, threaten, anger or intimidate; often accompanied by threatening gestures, and frequently followed by physical aggression.

Indirect aggression: a more complex form of aggression that involves attempting to harm by spreading rumours, attempting to humiliate or demean, or excluding the victim from a group.

Proactive aggression: unprovoked aggressive acts.

Reactive aggression: aggressive acts that occur as a result of provocation.

CHAPTER 1 YOUTH AGGRESSION IN CANADA: CANADIANS' BELIEFS ABOUT YOUTH AGGRESSION

According to a poll of Canadians commissioned by the Centre of Excellence for Early Childhood Development (CEECD)^{6, 7}, Canadians are concerned about aggression in young people in our society. In fact, among the five options they were presented with—youth suicide, youth health, school failure, poverty in families, and youth violence—32% of respondents listed youth violence as a top concern. Another 32% of respondents selected poverty in families as a top concern, and the other three options were all selected by smaller proportions of respondents.

The poll also revealed some interesting opinions among Canadians about aggression in young people in their provinces. For instance:

- Most respondents thought adolescence was the period in which physical aggression was most prominent (e.g., 61% thought boys and 69% thought girls resort most frequently to physical aggression in adolescence).
- 44% thought that, among children aged 6 to 11, boys are more likely than girls to attack others physically. Another 41% thought girls and boys this age attack others with a similar frequency, and 8% thought girls this age physically attack others more often than do boys the same age.
- 74% thought that additional investment in government violence prevention programs should target children aged 5 to 11 or adolescents aged 12 to 17.

It is clear that Canadians typically see physical aggression as a problem that starts in adolescence and is more likely to be a problem in boys than girls. They also believe that interventions designed to stop physical aggression should target preadolescent and adolescent populations.

It therefore comes as a surprise to many that, according to extensive research, problems with aggression take root at a much younger age. In fact, people display physical aggression more often during the preschool period than any other age period, and in order to be maximally effective, interventions that target physical aggression must start when children are below the age of five.

CHAPTER 2

WHAT IS AGGRESSION?

Most experts agree that there are three key types of aggression: physical, verbal, and indirect.

Physical Aggression

In young children, physical aggression includes behaviours such as hitting, slapping, kicking, biting, pushing, grabbing, pulling, shoving, throwing objects, beating, or limb twisting that is part of an antagonistic interaction with another person¹⁻⁵.

Proactive vs. Reactive Aggression

Physical aggression that occurs without any apparent provocation is known as proactive aggression. Children generally engage in proactive aggression in order to obtain a benefit, acquire an object, or intimidate another child. Walking up to a child and snatching a toy out of her hand is an example of proactive aggression. As children grow older and their brain develops, those prone to proactive aggression will usually begin to display more controlled and thought-out aggressive acts. For instance, they will learn to punch when adults are not looking and choose victims who are smaller than themselves¹⁻⁵.

Physical aggression that occurs in response to a perceived threat or provocation (whether this provocation is purposeful or accidental) is known as reactive aggression. For instance, one child playing with a favourite toy may punch another child for coming too close, in fear the toy might be taken away. Another child may not react until the other child actually starts yanking at the toy. These responses are both examples of reactive aggression. Reactive aggression tends to occur most frequently when children are faced with multiple

sources of frustration and anger. For instance, it can be a common occurrence in places where too many children are crowded together with too few toys¹⁻⁵.

Verbal Aggression

Verbal aggression refers to the use of hostile words to insult, threaten, anger, or intimidate another person¹⁻⁵. The classic verbal battle among children, which often ends, "I am not!" "You are too!" "Am not!" "Are too!" can continue until one or the other child bursts into tears. Even though only words are being hurled, there is no doubt that aggression is taking place. Often, verbal aggression is accompanied by threatening gestures and is frequently followed by physical aggression¹⁻⁵.

Indirect Aggression

Indirect aggression is a more complex form of aggression that involves attempting to harm another person by spreading gossip or rumours, attempting to humiliate or demean the other person, or attempting to exclude the victim from a group¹⁻⁵. With children's advancing social skills and command of language, indirect aggression can become increasingly effective and brutal^{1-5, 14}. Indirect aggression, which aims to isolate the victim from friends and other social contacts, has especially damaging consequences for children who feel shy and insecure or who are "different" in some specific way. Indirect aggression is the most common form of aggression among adults.

CHAPTER 3

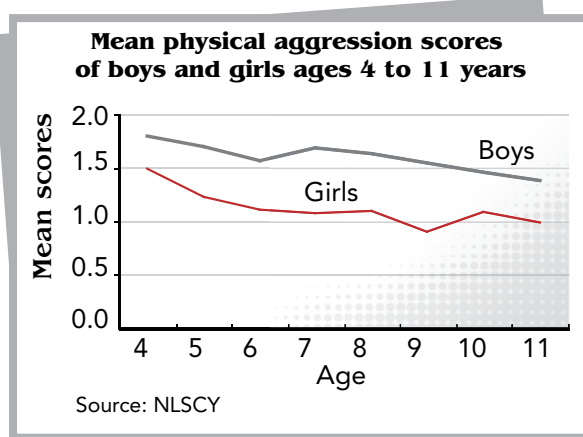
THE NATURAL COURSE OF HUMAN AGGRESSION

In general, human beings, like other animals, begin to show signs of aggression very early in life. The use of physical aggression increases until they

reach toddlerhood, at which point it begins to drop off. The diminishment of physical aggression in toddlers occurs as they attain certain new skills, such as use of language, to help them communicate their frustration more constructively and better manage their emotions.

Figure 1 below represents data from the National Longitudinal Study of Children and Youth (NLSCY). This study explored the aggressive behaviour of 22,831 children aged 2 to 11 years of age. Figure 1 shows that the frequency of physical aggressions diminishes from 4 to 11 years of age and tends to be higher among boys than girls throughout early and middle childhood¹⁵.

Figure 1



Aggression in Infants

While many people find it hard to believe that humans do not have to learn to aggress, there is overwhelming evidence that this is, indeed, the case. Earlier research on the development of aggression focussed on elementary and high school-age children because that is the time when the consequences of physical aggression start to threaten adults. However, more recent studies starting in infancy and following children into later years have

demonstrated that aggressive behaviour starts much sooner.

According to the latest research, physical aggression actually appears very early in life. Experts have reported that infants express anger before two months of age¹⁶. Young babies are not physically able to commit acts of physical aggression such as hitting or grabbing someone. They do, however, express anger and frustration with screaming and angry facial expressions. Some infants seem to have an especially short fuse and some scream more loudly and more persistently than others.

Vocal and facial exhibitions of anger are considered to be the first signs of aggressive behaviour in infants, but true physical aggression appears for the first time between six and twelve months of age, when babies have the motor control they need to make directed gestures. Early aggressive behaviour in infants often occurs in response to frustration, although that frustration may not always be obvious to an observer.

Aggression in Toddlers

As babies grow into toddlers, their use of physical aggression grows too. Research indicates that mothers report substantial increases in physical aggression among their children aged 12 to 24 months^{17, 18}. Although individual toddlers may vary widely in how often they use physical aggression, most two-year-olds use it as the first way to get what they want.

Some Facts on Toddler Aggression

Hitting is the most common form of aggression in children aged two and three; 70% of children aged two and three hit other children^{17, 19}.

TEMPER TANTRUMS¹⁻⁵

As aggressive behaviour increases in the very early years, children may start to display one of the most spectacular forms of aggression seen in childhood: temper tantrums. The vast majority of young children—85 to 90%—will throw at least one temper tantrum in their lives. These outbursts occur most often and most strikingly in children aged 18 months to three years, and they consist of noisy explosions of anger that start and end suddenly and unpredictably. A child throwing a temper tantrum will typically fall to the floor, cry, kick, scream, and flail about in a stunning show of uncontrollable rage. Temper tantrums are characterized by frustration, extreme distress, intense anger, and disruptive behaviour. Temper tantrums can be considered as a more developed display of the anger exhibited by newborns, who are physically unable to do much more than scream and make angry faces.

Temper tantrums are triggered by something that causes the child to experience intense frustration, whether it is physical provocation, absence of needed attention, or desire for an unavailable object. Children will be encouraged to throw tantrums if they find these outbursts to be an effective means of getting what they want. Most children, however, stop throwing tantrums at around age four, when brain maturation and learning experiences have allowed them to manage their emotions in more constructive ways.

70% of children aged 17 months and 80% of children aged 30 months will take a desired object by force from another²⁰. 25% of children aged 17 to 30 months bite others often or on occasion^{17, 20}.

In toddlers, occasional physical aggression is not a sign of a behaviour problem; the child can usually be readily guided to behave more gently. However, children who consistently choose physical aggression as their preferred mean of solving problems require professional help.

Aggression in Preschool and School-Age Children

By the time they reach the age of four, children have the motor skills they need to commit the acts of aggression seen in adolescents and adults. Fortunately, by this age their tendency to aggress physically has generally started to decrease¹⁻⁵.

BABIES ARE BORN WITH A BRAIN ABOUT ONE-THIRD THE SIZE OF AN ADULT BRAIN, BUT A FIVE-YEAR-OLD HAS A BRAIN ABOUT THE SAME SIZE AS AN ADULT'S

One of the main reasons children of this age are better able to control themselves is that the frontal cortex of a four- or five-year-old brain is more developed than that of a two- or three-year-old. The frontal cortex controls reactions to strong emotions, including aggressive reactions¹⁻⁵. A four-year-old who continues to use physical aggression regularly to get what he wants or to vent frustration may require professional assistance to learn to control himself better.

BY SCHOOL AGE CHILDREN ARE EXPECTED TO HAVE LEARNED ALTERNATIVES TO PHYSICAL AGGRESSION. THE INABILITY TO CONTROL PHYSICAL AGGRESSION IS A SIGN OF A SERIOUS BEHAVIOUR PROBLEM THAT REQUIRES PROFESSIONAL HELP¹⁻⁵

Studies of school children reveal that the vast majority of youngsters continue to reduce their physical aggression from the time they begin kindergarten to the time they finish high school^{15, 21, 22}. Both girls and boys show the same gradual reduction of physical aggression^{23, 24}. This positive change occurs despite the fact that, as children grow older, their exposure to aggressive models in the media, such as violent television shows and video games, actually increases.

Skills Associated with Desistance of Physical Aggression

Use of physical aggression in young children dwindles as they gain important skills necessary to obtain their goals via other means and to control their aggressive reactions. These skills are described below.

Development of Language

Language fluency involves two skills: the ability to decipher what others are saying, called receptive language, and the ability to make oneself understood, called expressive language. The mastery of language gives children a new tool to express frustration, and one that does not bring the negative consequences of physical aggression. In general, the more developed a child's language skills, the less that child is likely to use physical aggression, and the less developed the language skills, the more that child is likely to maintain frequent use of physical aggression²⁶.

Play Fighting

Both humans and animals use play fighting²⁷. Parents and educators should understand that play fighting

GROWTH OF VERBAL AND INDIRECT AGGRESSION

As physical aggression diminishes, children do not simply become peacemakers; verbal and indirect aggression usually increases. This change starts around age three or four and gets more hurtful and brutal as children's social skills and language develop. Girls generally use indirect aggression more often than boys^{14, 15, 25}.

PLAY FIGHTING: NOT WHAT IT MAY APPEAR TO BE

Most children, especially boys, engage in rough play that can look like aggression, but the intent and result are quite different. Play fighting is not a form of aggression, since the "antagonists" are having fun, and sometimes testing themselves physically against each other. Play fighting is actually a positive development in which children learn how to manage their aggressive reactions and decrease the frequency of real aggression²⁷.

in young children provides a valuable learning experience. While the fights may appear dangerous, particularly among boys, the onset of play fighting actually marks a new stage in child development, as play fighting requires self-control and the ability to make believe, while still using aggressive gestures¹⁻⁵.

Play fighting allows children to test themselves against others, learn who is physically stronger, and understand which aggressive behaviours are acceptable and which are not. Play fighting also requires that children learn compromise and respect for rules. Typically, the rules that govern play fighting include letting others win occasionally, not using too much force, not hurting the other player, and ensuring that all players are having fun¹⁻⁵.

Development of Social Skills

Physical aggression also diminishes in children as they learn social skills. These skills are behaviours that signal a child's ability to approach and understand others and please both peers and adults. They include sharing, helping others, waiting one's turn, and working out compromises. Young children who are developing social skills will try to cooperate with others, look for understanding and sympathy, and comment on other children's emotions, such as, "She feels sad because her ice cream fell". The mastery of these skills offers children another means of getting what they want as well as a way of deliberately avoiding conflict¹⁻⁵.

Important social skills for young children include:

- Approaching a new peer or peer group to play.
- Identifying emotions in themselves and others.

- Showing cooperation with adults and other children.
- Expressing emotions rather than falling into a tantrum.
- Using negotiation with others to share or cooperate in reaching a goal.

Part of social skills is the art of reconciliation. Learning how to reconcile after a conflict can greatly diminish future aggressive interactions and help re-establish cooperation between former antagonists¹⁻⁵.

CHAPTER 4 CONSEQUENCES OF UNCONTROLLED AGGRESSIVE BEHAVIOUR

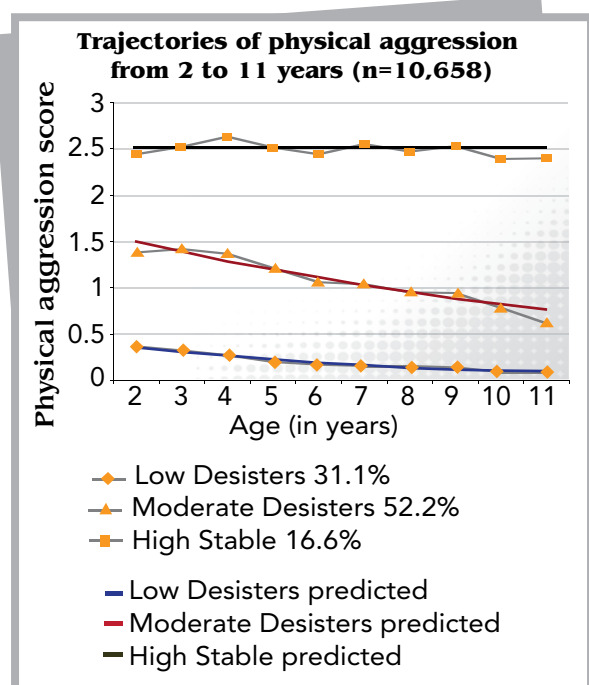
About five to 10% of children maintain highly aggressive behaviours as they grow out of their preschool years. Children who do not learn from an early age to replace their physical aggression with more socially appropriate behaviours, such as communicating verbally, compromising, and cooperating with others, are at a considerably increased risk for school troubles and school drop-out, delinquent and criminal behaviours, substance abuse problems, and unemployment²⁸.

Persistence of Aggressive Behaviour

A large longitudinal study in Canada suggests that children who have greater difficulty controlling their aggressive behaviour than their peers, when they enter kindergarten, are more likely to persist with behavioural problems as they grow older²⁹, and those who remain frequently physically aggressive during elementary school are much more likely to be violent during late adolescence²². Similar results were obtained with other large samples in Canada, New Zealand and the USA²⁴.

Recent analyses of the Canadian NLSCY demonstrated three typical trajectories of physical aggression among children aged 2 to 11³⁰.

Figure 2



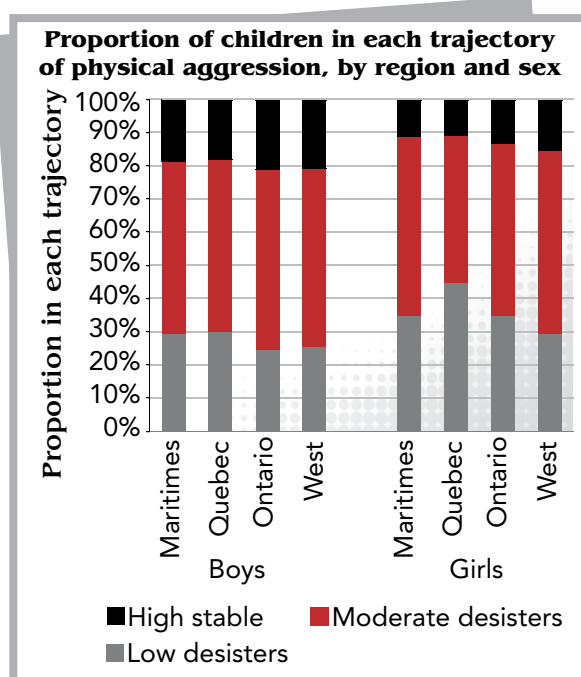
The majority of children (52%) follow a middle course, with a substantial decrease in the frequency of physical aggression with age. A smaller proportion (31%) follow a similar trajectory, but with lower overall frequencies of physical aggression. The smallest group (17%) shows a trajectory of chronic physical aggression. They exhibit the highest levels of physical aggression at age two and apparently do not learn to use alternative strategies to solve problems as they grow older.

A further analysis of the NLSCY data shown in Figure 2 indicated that there were regional and sex differences in the proportion of children on the high and the low trajectories of physical aggression. Figure 3 summarizes these differences: Children from Ontario and the Western

provinces were more likely to be on the high trajectory, and less likely to be on the low trajectory, compared with children from Quebec and the Maritime Provinces.

Boys were more likely than girls to follow the high aggression trajectory, in all the Canadian regions.

Figure 3



Similar trajectories were observed in U.S. research conducted with a large sample of children by the National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network¹⁹.

Aggression and School Performance

Based on 2004-2005 statistics, 14% of young Canadian men and 9% of young Canadian women do not finish high school by the time they are 20–24 years old³¹. Their low education level reduces their potential to succeed in any career and to contribute to society. It also increases their reliance on unemployment, welfare, and other social

services³². School dropouts are more likely to be involved in criminal activity, have physical and mental health problems, and be affected by substance abuse. They are less likely to be involved in their communities and more likely to have children who also drop out of school early³²⁻³⁴.

Aggressive behaviour is a known risk factor for school dysfunction, including early academic difficulties and reduced likelihood of graduation^{35, 36}.

Aggressive behaviour appears to be an early factor that can set off a chain reaction that can ultimately lead to poor school performance. Aggressive children have fewer cognitive, social and emotional skills at their disposal, making them more likely to be rejected by other children, more likely to have deviant friends and less likely to get along with their teachers^{29, 37-39}. Children who have difficulty getting along with their peers and teachers at school are less likely to participate in class, achieve academically and eventually complete high school^{39, 40}.

Aggression Linked with Other Problems

The problems caused by unchecked physical aggression are not limited to school. Children who follow a high, stable trajectory of physical aggression from ages two to nine years have more disruptive behaviour problems and symptoms of depression in grade 3 than those with low aggression. They also have lower quality friendships, poorer social skills, and more behaviour problems compared with children with moderate aggression⁴¹.

Across large samples of children from Canada, the United States, and New Zealand, boys and girls who persistently exhibited high levels of aggression during elementary school were more

likely to engage in violent delinquency as adolescents. For boys in the Canadian and New Zealand samples, high aggression trajectories during elementary school also increased the risk for non-violent delinquency in adolescence²⁴.

CHAPTER 5 UNDERSTANDING AGGRESSION

In addition to knowing about the natural course of aggression, the factors associated with its general decrease with age, and the consequences of persistent aggression, it is important to know about the risk factors and processes associated with persistent aggression. This knowledge is essential for effective prevention and intervention.

Sources of the Predisposition to Aggression

One of the critical insights in understanding aggression is to accept that it is part of the normal evolution of human life¹⁻⁵. Aggression in very young children is not a sign of wickedness, nor is it a proof of poor parenting. Young children simply use aggression to get what they want. As long as physical aggression works and there are no negative consequences, they will keep on using it¹⁻⁵.

Species Heritage

All human infants are born hard-wired to behave in certain ways: crying when they are hungry, seeking a cuddle from their mothers when they are hurt, or snatching a toy from another child when they want it. These behaviours are natural; they do not need to be learned. Aggressive behaviour is one of these "natural" behaviours. Children do not need to see aggressive behaviour in order to learn to act aggressively¹⁻⁵.

CHILDREN THROW TEMPER TANTRUMS WITHOUT ANYONE EVER TEACHING THEM TO

At the same time as children naturally exhibit aggression, they also develop what is called pro-social behaviour, which encourages positive social interaction. Pro-social behaviours include smiling, friendly touching or patting, following or copying another person, and sympathetic crying when a child sees or hears another child cry. We can infer that empathy and the desire to be with others, to be accepted, and to be liked are also innate in children¹⁻⁵. The role of parents and other adults is therefore to encourage children's natural use of these pro-social behaviours, while discouraging their natural use of aggressive behaviours.

Notwithstanding the natural propensity to use aggression, individuals vary considerably with regard to how easily they can be provoked into an aggressive act and how persistently they will use aggression in response to provocation or to obtain what they want.

Four key factors come into play with regard to the aggressive tendencies of any individual. They are summarized below.

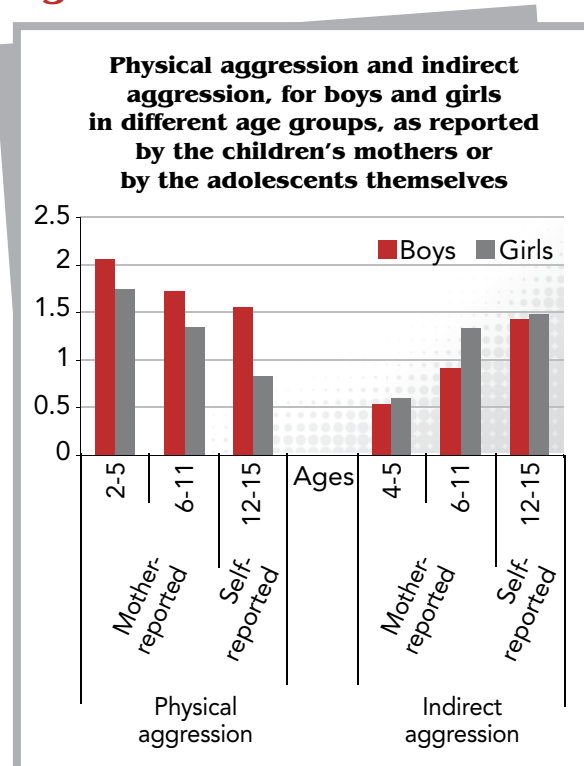
Gender Heritage

Until approximately the age of three, physical aggression is seen in both sexes nearly equally, but girls tend to attain a lower peak of physical aggression than boys, and they generally start to diminish their use of physical aggression

sooner and faster^{18, 25, 42}. After the age of four, twice as many boys use physical aggression as do girls^{28, 30}.

Figure 4 shows data on Canadian children from the National Longitudinal Study of Children and Youth (NLSCY) in 2000-2001. According to mothers reports, boys engaged in more physical aggression than girls. In contrast, indirect aggression was more common among girls, especially during elementary school (6-11 years old). When adolescents (12-15 years old) were asked to rate their own physical and indirect aggression, physical aggression was much higher for boys, but indirect aggression was equivalent for both boys and girls^{43, 44}.

Figure 4



Boys also maintain a stronger propensity toward physical aggression than do girls. In the NLSCY sample, 62% of the children following a high stable trajectory of aggression from ages 2 to 11 were boys. Conversely, more of the children on the low trajectory were girls (56%)³⁰. Similar sex differences were found in the US NICHD sample¹⁹.

Family Heritage

Family history is an important factor that can predict the degree to which a child will use physically aggressive behaviour. Research has shown that boys whose mothers have a low level of education and who had their first child when they were relatively young were at highest risk of chronic aggression. That is, they were more likely to rely on physical aggression from kindergarten to adolescence^{19, 30, 45, 46}. Further, infants and toddlers with high levels of physical aggression are more likely to have parents with a history of behaviour problems^{46, 47}.

Children may inherit a tendency to resort to physical aggression from their parents for genetic reasons. A Canadian study of over 500 pairs of 18-month-old twins showed that the pairs of identical twins, who share all their genes, were more similar in the frequency of their physical aggressions than fraternal twins, who share only half their genes. The same study evaluated language performance at 18 months and showed that it was less genetically determined than physical aggression⁴⁸.

Genetics appear to play a smaller role in determining how much children use social aggression, which includes behaviours such as excluding other children from a group, ignoring them, or making faces at them. In a study on the same Canadian sample of twins, when they were six years old, researchers found that the environment in which the children were raised played a much greater role than genetics with respect to these children's use of social aggression⁴⁹.

Children may also learn from observing their parents that aggression is an appropriate means of handling stress and frustration. Infants of parents who get angry at their child and use physical punishment are more likely to show chronic physical aggression in early childhood. There is also good evidence that children who were abused and neglected during childhood are at higher risk of violent behaviour as adolescents and adults^{50, 51}. From this relationship many have concluded that children learn to aggress from aggressive parents. However, since children do not need aggressive parents to learn to aggress, the relationship may be due to the fact that parents' aggression reinforces the natural aggressive tendencies of children. In families where aggressive behaviour is the norm for adults, in addition to an increased genetic risk for aggression, children do not have models to learn how to moderate their own aggressive impulses^{3, 5, 28}.

***FAMILY HERITAGE MAY
BE A RISK FACTOR FOR
AGGRESSION THROUGH
BOTH GENE TRANSMISSION
AND PARENTS' BEHAVIOUR²⁸***

In addition, there is some good evidence that how young children are parented, as well as the family environment in which they are raised, is related to their social and emotional development. In general, parents who are sensitive, responsive, involved, and proactive and who provide their young children with structure are most likely to raise children who are socially and emotionally well-adjusted. On the other hand, parents who are neglectful, harsh, distant, punitive, intrusive, and reactive are at increased risk of raising children who have social and/or emotional adjustment problems⁵². Children who are aggressive are more likely to have parents who are highly punitive and critical of their children^{53, 54}. Researchers now agree that this association works both ways, that is, the parent's behaviour influences the child's behaviour, but the child's behaviour also influences the parent's⁵⁵. Nevertheless, as will be shown later, interventions that help parents modify their parenting behaviours can be useful in reducing their children's aggression.

Intrauterine Environment

The major part of a baby's brain and nervous system development occurs in the uterus. As a result, it is reasonable to believe that the intrauterine environment can have an effect on the risk of whether individuals go on to develop frequent aggressive behaviour.

Developmental delays can include the inability to adequately control aggressive impulses^{1-5, 56}.

The use of alcohol, cigarettes and cocaine by the mother during pregnancy have all been associated with increased risk for developmental or behavioural problems in the child^{46, 57-59}.

For example, studies exploring the link between smoking during pregnancy and the child's later behaviour suggest that children whose mothers smoked during pregnancy are at higher risk for developing behaviour problems and hyperactivity and are more likely to be involved in juvenile crime^{60, 61}. These observations hold true even after taking into account the effects of other factors, like postnatal tobacco exposure⁶². Links between prenatal smoking and physical aggression and hyperactivity during early childhood specifically have also been observed^{46, 63}.

The reason for the link between prenatal tobacco exposure and postnatal antisocial behaviour is not yet well understood. Experts have suggested that tobacco exposure may result in reduced oxygen available to the foetus, changes in brain chemistry (particularly the serotonin and dopamine neurotransmitter systems), and changes in DNA and RNA production in the brain⁶⁴.

Temperament

An individual's predisposition toward learning and social interaction is part of an innate and intrauterine determined set of qualities that we call temperament or personality. Temperament is influenced by genetic inheritance as well as by the environment in which people develop

EARLY SIGNS OF A REACTIVE TEMPERAMENT

One of the first signs of an infant's temperament is the energy and intensity with which he or she reacts to the environment¹⁻⁵. Some babies wake quickly and cry when disturbed by noises, light, changing diapers, etc. Other babies sleep through noises or bright lights, remain relaxed while being changed, and fall asleep easily in different environments. A highly reactive infant is more likely to have behaviour problems⁶⁵.

and grow both before and after birth. Signs of an individual's specific temperament are shown from early infancy: some babies are restless, fussy, and hard to calm. Others are relaxed, ready to smile most of the time and easy to calm¹⁻⁵.

CHAPTER 6 CONTROLLING AGGRESSION

Recent research into aggression in children has revealed some effective ways to stop or reduce the aggressive behaviours that cause problems as children grow up⁶⁶⁻⁶⁸. This research has identified several approaches that can assist parents and educators in their interactions with young children. These approaches are grouped below under three headings: Observing, Understanding, and Intervening.

Observing

The first step in effective intervention for aggressive behaviour is observation; one must know what has really happened before one can respond usefully. The goal is to stop or prevent children from acting aggressively with others and then to teach the children more socially acceptable forms of interaction. To do so, it is crucial to learn to observe what happens before, during, and after an aggressive act. Skilled observation makes it possible to intervene in time to prevent an aggressive act, or to intervene appropriately when an aggressive act has occurred. It involves identifying correctly the aggressors and victims, knowing exactly what aggressive behaviour occurred, being aware of how often these actions happened, and in what context they occurred, including the actions of adults and other children in the vicinity that may have a negative or positive effect on the aggressive acts¹⁻⁵.

EFFECTIVE OBSERVATION MEANS¹⁻⁵:

- Monitoring children when they interact.
- Being aware of what triggers aggressive acts.
- When aggressive acts actually occur, identifying who acted aggressively and who was victimized.
- Keeping track of how often aggression occurs and with which children.
- Noticing how other children react and how adults respond.

IN CHILDREN, COMMON TRIGGERS FOR AGGRESSION ARE COMPETITIONS FOR TOYS, SPACE, OR THE ATTENTION OF ADULTS¹⁻⁵

Intervening

Knowledge about the natural course of aggression and its risk factors can help inform the ways in which parents, caregivers and society in general may become involved to foster socially desirable interactions and reduce aggression.

Environmental Factors that Foster Development of Peaceful Interaction

Parents and caregivers can help foster the natural development of socially desirable behaviour in young children by first ensuring that the environment in which they develop and grow is a safe and healthy one.

Optimal Prenatal Environment

As discussed previously, children damaged by an adverse prenatal environment are at increased risk for many physical and psychological problems. As a result, one very effective way to prevent chronic aggression, like other behavioural problems, in children, is to ensure that they start out with a well-functioning brain. This means protecting the environment of the foetus.

An optimal prenatal environment will ensure that the foetus develops the brain structures required to control anger and negative impulses and exercise good judgment as well as those that support the development of language skills¹⁻⁵. This environment requires good prenatal nutrition, refraining from using alcohol, cigarette and several other drugs, adequate rest, relief of stress, and positive support for the responsibilities that motherhood implies.

It is also important to ensure that the foetus is not exposed to toxins or other substances that might harm the developing nervous system. The pregnant woman, her family, and friends all have a role to play in keeping an expectant mother's environment free of cigarette smoke, pollutants, pesticides, herbicides, varnishes, solvents, and so on¹⁻⁵.

Healthy Diet

Continuing the process of protecting and enhancing a child's biological equipment, child care in the early years should ensure that children stay as healthy as possible. A healthy diet contributes directly to growth of healthy brain structures, which permit children to learn to manage their moods, impulses, and behaviour¹⁻⁵. Dietary deficiencies in young children are related to cognitive deficits and behavioural problems, including aggression⁶⁹. To

IMPORTANCE OF A CARING AND STIMULATING ENVIRONMENT

Care and stimulation is crucially important for an infant's emotional, cognitive and social development. Children need affectionate hugs and cuddles and comforting attention when distressed. They also need to be cognitively and emotionally stimulated by playing with friends and parents. Book reading with parents and play fighting with friends and siblings are different ways of providing a stimulating and warm emotional environment to enhance children's socialization^{1-5, 26, 27, 76}.

give children the best chance of developing successfully, their diet must be balanced and be sufficiently rich in essential nutrients like iron, iodine, zinc, folic acid, protein, vitamins, and essential fats¹⁻⁵.

The brain is very sensitive to changes in diet¹⁻⁵. Many of the amino acids required for brain functioning are not produced in the human body and must therefore be found in food. For instance, the amino acid tryptophan is required for the synthesis of serotonin, which has a calming or sedating effect. Low serotonin levels in children's brains have been linked with aggressive behaviour and with difficulty in controlling emotions⁷⁰⁻⁷².

Stimulating Environment

From birth, babies need stimulation and interaction. The first three years of life are critically important for growth and development of certain brain areas that are crucial if children are ever to learn normal socialization. The development of motor control, the ability to wait, speak, and seek solutions to problems are all tied to early stimulation in infancy⁷³.

Provision of a stimulating environment is the joint responsibility of parents and child care organizations⁷⁴. Babies obtain necessary stimulation through games, face-to-face contact, music and rhythm, physical activities, and interaction with adults and other children. Such simple items as the mobile over the crib, nursery rhyme sing-along, babbling and smiling with the baby, and all the fun things people do spontaneously with babies are vitally important for healthy development¹⁻⁵.

Intervention programs for at-risk families as well as intensive, high-quality preschool programs where children receive good stimulation from qualified early childhood workers reduce the risks for persistent preschool aggression⁷⁴, and violent and non-violent delinquency in adolescence and adulthood^{11, 75}.

Care that Fosters Development of Peaceful Interaction

Early in a child's life, adult intervention to support peaceful behaviour and to discourage physical aggression can effectively enhance the child's emerging control over emotions and actions. Some of these interventions are described below.

Caregiver Response to Children's Aggression

In order to help children overcome frustration and achieve goals peacefully, parents and caregivers must teach children to inhibit their aggressive behaviours and replace them by socially acceptable behaviours. For instance, they should try to foster the development of behaviour control, help children to respond to others with empathy, and encourage problem-solving. Inappropriate responses from caregivers to young children's lack of emotional and behaviour control can increase the risk of problems with aggression. Inappropriate responses include both under-reacting and over-reacting: the caregiver must not ignore physical aggression, give in to it, or make a major fuss about the child being "bad"¹⁻⁵.

Fostering Learning of Peaceful Conduct

It is important to know that children's brain continues to develop long after birth; it is constantly being changed or sculpted by experience. When a child learns something new the structure of the brain changes. Repeated experiences strengthen new connections in the brain and reinforce this learning. This means that early childhood is an optimal time to learn socially appropriate behaviour and skills that will be useful throughout a lifetime¹⁻⁵.

Many of the most effective interventions that help children learn alternatives to physical aggression are practiced almost instinctively by parents and caregivers. The effect of many childhood games and pastimes is to teach children the pleasures and rewards of peaceful interaction and to help them learn how to get rewards without fighting¹⁻⁵.

EXAMPLES OF INTERVENTIONS THAT FOSTER THE LEARNING OF PEACEFUL CONDUCT INCLUDE¹⁻⁵:

- Timely interruption to defuse explosive situations.
- Separating combatants with a "timeout."
- Teaching new skills, such as using words instead of screams to express feelings.
- Organizing the resources for play to minimize conflict and frustration.
- Providing pleasurable moments that create bonds between children and parents, educators, and other adults.

NOT ignoring aggressive behaviour or contributing to it by shouting or slapping.

NOT leaving children to solve aggression problems on their own when they are not able to do so.

NOT putting children in situations that create pointless frustration.

NOT imposing punishment that is excessive or age inappropriate.

Stimulating Development of Language

Language offers an alternative to aggression for children to express anger and frustration²⁶. Concrete ways to help children develop language include¹⁻⁵:

- Imitating baby talk, congratulating baby on every effort, and attempting to understand what baby is trying to express. It is important to talk to babies even if they don't understand what's being said. They do understand that they are important to the adult, which encourages them to try to please.
- Chatting with young children and expressing interest in their thoughts.
- Encouraging children to talk to each other, and helping them to use words to solve conflicts and express their desires, opinions, and ideas.
- Reading stories, nursery rhymes, and songs. These activities play a vital role in development of hearing, concentration, and sound recognition. They help children recognize words and learn their meaning.

Stimulating Development of Social Skills

Social skills also have value in decreasing the use of physical aggression in children¹⁻⁵. These skills give children alternatives to aggression as a means to fulfil their needs. A lack of social skills in a child often means isolation, which in turn impairs development, producing more isolation¹⁻⁵. Physically aggressive children often lack social skills, perhaps because they are not naturally inclined to learn and use them, they have not been adequately taught, and/or because whatever intervention has been used with them has been inappropriate.

EXAMPLES OF APPROACHES THAT FOSTER THE LEARNING OF SOCIAL SKILLS INCLUDE^{1-5, 77}:

- Encouraging children to work cooperatively with others, join in games, take turns, and share toys and playground equipment.
- Helping children to be aware of their emotions and those of others, and encouraging them to match feelings with words.
- Taking advantage of conflicts to teach children to reconcile.
- Teaching children about the needs of others.
- Avoiding the tendency to isolate or exclude children who lack social skills. Do not place children with poorer social skills into a separate group. Integrating them with others helps them to learn the behaviours that they lack^{68, 78}.

Disciplining Aggressive Behaviour

While recognizing that every human spontaneously aggresses during early childhood, we also know that humans are social creatures, and living in society requires socially acceptable ways of reaching goals.

Young children need to learn the negative consequences of their aggression on others. They must be taught that aggressive acts are hurtful to others, are not acceptable behaviour, and will not get them what they want. Children must be shown alternative ways of making their wants known and peaceful ways of achieving them¹⁻⁵.

The manner in which parents react to their children's early aggressive behaviour can

affect how often their children will resort to aggression in the future. Parents who sometimes ignore aggression, or who sometimes respond to aggression by giving children what they want demonstrate that aggression can be an appropriate means to an end. It is more effective to use consistent discipline, suited to the child's level of development, in which children can learn what is a good way to get what they want, and what simply doesn't work⁷⁹.

TIPS FOR HELPING PARENTS, CAREGIVERS AND EDUCATORS DISCIPLINE CHILDREN¹⁻⁵:

- Be present and aware of what is happening. Accurate observation is the key to effective supervision and intervention.
- Understand that discipline is more than punishment; it is teaching children to stop, wait, speak, and solve problems.
- Think out disciplinary actions that are appropriate for each child's age: this will lead to new learning.
- Set clear rules to establish what is and isn't acceptable as well as the consequences of breaking those rules.
- Enforce the rules fairly and consistently. Do not let children get away with breaking rules.
- Make sure that everyone in contact with the children knows what the rules and consequences are.
- Forge positive emotional bonds with children; they are more likely to respond to discipline when they sense attachment and affection from the adult involved.

When disciplining aggressive behaviour, it is important to try to understand what situation, goals and emotions preceded the aggressive act, because children must learn different lessons when they use proactive versus reaction aggression, in order to develop more peaceful strategies. When children use proactive aggression, they need to recognize the harm they do to their victims and learn peaceful ways of getting what they want. They must realize that even though aggressive behaviour may benefit them in the short term, it has serious negative consequences that can be lasting, such as being left out of activities they might enjoy^{1-5, 77, 79, 80}.

When children use reactive aggression, they need to learn to identify situations that provoke their anger. They should be helped to develop strategies to regulate that anger, avoid conflict situations, and seek outside help if necessary^{1-5, 81}.

KEY QUESTIONS THAT HELP DETERMINE IF YOU ARE HAVING DIFFICULTY DISCIPLINING CHILDREN:

- Are my punishments received with indifference?
- Does the severity of my punishments depend on my mood?
- Do I resort to physical punishment or insults?
- Do I ignore behaviour that should be punished?
- Do I feel ineffective when I try to discipline a child?

Source: 34-item questionnaire on the evaluation of parental behaviour⁸²

WHEN TO SEEK PROFESSIONAL HELP¹⁻⁵

Child does not:

- Respond to adult discipline.
- Learn to control aggressive behaviour.
- Create positive ties with adults and children around them.

In such cases, it is important to seek professional help without delay as the problem will not simply go away and can have serious long-term consequences.

Available Intervention Programs

For Infants, Toddlers and Preschoolers

There have been only a few rigorously designed intervention studies on programs that aim to reduce aggression problems during infancy and the preschool years. However, the available evidence does suggest that intervention at this age level can be useful to decrease children's aggression and/or to decrease the family risk factors associated with child aggression (such as child maltreatment, for example).

Programs for infants and toddlers are usually directed at parents, while programs for preschoolers (3-to-5-year-old children) often also involve the children's participation.

Available research suggests that programs focussing on the parents of infants and toddlers are most effective when they address specific problem behaviours in the children, such as aggression, and cover multiple issues at once (e.g., parents' skills, parents' well-being, the family's economic status, other caregivers who may care for the children). The most effective programs also train their staff intensively and are successful at enlisting the support and enthusiasm of parent⁵².

A nurse home-visitation program has been found to be successful for reducing risk for the child to be abused or neglected⁸³ and to be arrested and convicted of a criminal offence as an adolescent⁸⁴. In this program, trained nurses visit first-time mothers approximately once a month during pregnancy and up until the child is two years old. The program aims to promote the health of the mother as well as a good mother-infant relationship^{85, 86}.

Another successful program targets parents of preschool children who are about to enter kindergarten⁸⁷. In weekly parent group sessions, it teaches parents how to support the development of their children's social skills and how to use

effective discipline strategies, with the goal of preventing conduct problems. This program was shown to be effective with families of low socio-economic status in improving parenting practices and children's social competence, and reducing children's conduct problems.

A high-quality preschool program has also been effective in reducing at-risk children's later violent crime rates, in addition to increasing their education level and economic self-sufficiency⁸⁸. This preschool program involves teachers who hold bachelor-level training in early childhood education and receive regular continuing training. It is offered to children for at least half a day every day, during two years (when they are 3 and 4 years old), with a 1:8 teacher-to-child ratio. The program follows a curriculum that emphasizes children's learning through experience, and involves regular contacts between the teachers and the parents (either through home visits or other activities)⁸⁸.

For School-Age Children

Most of the documented interventions targeting children specifically have taken place among those of school-age, sometimes starting with children of kindergarten age. However, most of these programs target disruptive behaviour rather than physical aggression⁸⁹.

Interventions that include multiple components appear to be the most effective of all. They may involve parent training, teacher training and direct child training. In parent training, therapists lead parent or parent group discussions, in some cases with the support of videos, to foster positive parent-child relationships and teach parents to use effective and

non-violent discipline. Teacher training is designed to show educators how to implement effective classroom management to reduce aggression in class and foster social, emotional, and academic competency. Finally, child training involves overtly teaching children social skills, emotional language, anger management strategies, and problem-solving skills, usually in small group settings.

Multimodal intervention programs are useful because they can target several aspects of the child's behaviour, as well as risk factors associated with child aggression. For example, while parent training and teacher training can each be effective on their own to reduce children's aggression, it is best to use direct child training to help them improve their social skills⁹⁰.

Such a multimodal intervention program was studied in the Montreal Longitudinal-Experimental Study (MLS). The program targeted children from a low socio-economic context who were disruptive (i.e., aggressive and hyperactive) according to their kindergarten teachers. Disruptive children were assigned at random to either the control group (no intervention) or the intervention group. This intervention program lasted two years, when children were 7 to 9 years old, and included both a child skills-training component and a parent-training component. A unique feature of this program was that non-disruptive children were involved in the skills-training group sessions, in order to serve as models for their disruptive peers.

Results of this experimental study showed that this intervention program

was effective in reducing children's conduct problems^{68, 78, 91} and aggression more specifically⁶⁷. Children who had participated in the intervention program were less likely than other disruptive children (the control group) to follow trajectories of high aggression in adolescence. In fact, their aggression trajectories were comparable to those of

children who were at low risk (i.e., non-disruptive in kindergarten)⁶⁷. In addition to their reduced aggression, children who participated in the intervention program were more likely to graduate from high school and less likely to have a criminal record at age 24 than children who did not, and were comparable to their peers from the same low socioeconomic context⁶⁶.

CONCLUSIONS

Aggression in children is not an aberration; in fact, it is perfectly normal for children to use aggression at least occasionally, especially in infancy and toddlerhood. Even so, aggression can and must be curbed, as early as possible, if children are to develop into well adjusted, successful members of society.

Certain factors are understood to increase risk for persistent aggressive behaviour. Children born to very young mothers with little education, or to parents with aggressive or uncontrolled behaviour, are more likely to retain their physically aggressive behaviours, while other children show a decrease in aggression after toddlerhood. Similarly, children born to mothers who smoke while pregnant have been shown to be more hyperactive and physically aggressive.

But for their own benefit, and that of a cohesive, well-functioning society, children need to be taught that physical aggressions are unacceptable because they are dangerous, they create a climate of fear, and there are better ways to get what they want.

Living in society requires people to learn peaceful, socially acceptable ways of reaching their goals. And these all-important lessons cannot begin too early. Indeed, the preschool years are the crucial time for children to learn how to substitute socially appropriate strategies for physical, verbal, and indirect aggression.

The most effective approach unfolds on multiple fronts, beginning even before birth with the environment to which a child is exposed.

As bullies will attest, physical aggression can be an effective tool to achieve certain desired ends. Children don't need to learn it; humans are born ready to survive in the jungle. As long as physical aggression works, and there are no serious negative consequences, they will keep on using it.

For example, a healthy prenatal environment and healthy postnatal diet contribute directly to the growth of healthy brain structures, which help children better manage their moods, impulses, and behaviour, and develop the skills they require to express their needs and frustrations in a socially acceptable manner.

From birth, babies need warmth, responsiveness, stimulation and interaction. During the first three years of life, physical affection, responsive care and play, including fighting, are pivotal to the proper development of the brain areas that control normal socialization.

Language development also plays a key role during this vital period. Toddlers who use words to express their wants, anger or frustration are substantially further along the road to socialization than those who have difficulty expressing themselves verbally.

In addition to providing a favourable environment and fostering language development, caregivers should also actively teach behavioural control. They can start by modelling appropriate behaviour, where disputes are resolved through peaceful means. At the same time, they should show children how to control angry outbursts, to empathize with others, and to resolve problems in a constructive and peaceable manner.

But modelling and teaching socially appropriate behaviour is not always enough. Structure and discipline are other important ingredients in raising pleasant, well-behaved children.

For example, parents must resist the urge to give in when the child behaves aggressively. Children learn quickly that if a tantrum sometimes brings rewards, it is an effective strategy that should be used again. Far better for parents to apply measured and consistent rules that are suited to the child's level of development, and to teach children appropriate strategies to get what they want, as well as appropriate ways to deal with their frustration when they cannot get what they want.

Despite parents' best efforts, some children have more difficulty learning to control aggressive behaviour, to respond to discipline, and to fit in with other children and adults. In such cases professional support may be required, because the problem of unruly children will not fix itself. And, left unresolved, it can have serious long-term consequences as they grow taller and stronger.

So far, there have been few rigorous studies to gauge the impact of programs aimed at curbing physical aggression in infants, toddlers and preschoolers. However, available evidence suggests that intervention at this age can have a greater impact than at later ages.

Intervention programs for preschool children typically aim to strengthen the family environment and to provide high quality out-of-home social environments for children of high-risk families. Some work with individual high-risk families in their homes; others are delivered to groups of parents, sometimes through preschools or daycares.

The available research suggests that the most successful intervention programs for infants and toddlers address a range of issues simultaneously, such as the parents' skills and well-being, their economic circumstances, and the quality of the child's learning experiences outside the home.

Programs aimed at reducing problem behaviour among school-age children have been more widely studied. Interventions addressing several components of a child's environment simultaneously appear to have the greatest success. Research suggests

that the best outcomes are achieved when programs deal simultaneously with the child, his or her family and school environment.



But for all that is known about the effectiveness of different types of programs, much remains unknown. While research shows the usefulness of early intervention to reduce childhood aggression, more research is needed to refine empirically-supported programs and understand when they do not work, with whom and why.

Fortunately, many researchers have accepted the challenge and are devising the high-quality studies that will help parents, educators and public-policy leaders understand what works and what does not.

With this report and other related initiatives, the Centre of Excellence for Early Childhood Development will continue its efforts to provide parents, caregivers and policy-makers with the information they need to help every child reach his or her full potential as a positive member of society.

AUTHORS

Richard E. Tremblay, Ph.D., Professor in pediatrics, psychiatry and psychology, University of Montreal; Director of the Research Unit on Children's Maladjustment (GRIP); Director of the Centre of Excellence for Early Childhood Development (CEECD) and Director of the Early Childhood Learning Knowledge Centre (ECLKC) of the Canadian Council on Learning (CCL)

Jean Gervais, Ph.D., Professor in the psychoeducation and psychology department, Université du Québec en Outaouais

Amélie Petitclerc, M.A., Research Unit on Children's Maladjustment (GRIP)/ Early Childhood Learning Knowledge Centre (ECLKC), Laval University

COLLABORATORS

STATISTICAL ANALYSIS

Alain Girard, M.Sc. Research Unit on Children's Maladjustment

REDACTION

Alison Palkhivala, B.A., Medical Writer

COORDINATION AND REVISION

Christine Marcoux, M.A., Early Childhood Learning Knowledge Centre

Emmanuelle Vérès, M.A., Early Childhood Learning Knowledge Centre

Claire Gascon Giard, M.Sc. Centre of Excellence for Early Childhood Development / Early Childhood Learning Knowledge Centre

Nathalie Moragues, Ph.D., Early Childhood Learning Knowledge Centre

REFERENCES

1. Gervais J, Tremblay RE. Aggression in young children: The Interactive Guide to Observe, Understand and Intervene. Directed by Jean-Pierre Maher. Soon to be released from National Film Board of Canada-2008: www.nfb.ca.
2. Gervais J, Tremblay RE. Origins of Human Aggression: The Other Story. Directed by Jean-Pierre Maher. National Film Board of Canada, 2005. www.nfb.ca.
3. Tremblay RE. *Prévenir la violence dès la petite enfance*. Paris: Éditions Odile Jacob; 2008.
4. Tremblay RE. Anger and Aggression. In: Haith MM, Benson JB, eds. *Encyclopedia of Infant and Early Childhood Development*. Vol. 1-3. 2nd ed: Academic Press; 2008.
5. Tremblay RE, Nagin DS. The developmental origins of physical aggression in humans. In: Tremblay RE, Hartup WH, Archer J, eds. *Developmental origins of aggression*. New York: Guilford Press; 2005.
6. Tremblay RE. The spirit of the Teddy Bear: beyond opinions. *Centre of Excellence for Early Childhood Development Bulletin*. 2002;1(2):1.
7. Centre of Excellence for Early Childhood Development. Opinion poll regarding aggression among young children in Canada. Omnibus research report: perceptions and opinions of Canadians regarding aggression among young children. Québec, QC: Léger Marketing. Available at: www.excellence-earlychildhood.ca/documents/SondLégerAggressionANG.pdf.
8. CEC Network. *The cost of studying in Canada*. Ottawa: www.studyinCanada.ca/english/cost_of_studying_in_canada.htm; 2008.
9. National Crime Prevention Council. *Money well spent: Investing in preventing crime*. 3. *The cost of crime*. Ottawa: Public Safety Canada. Archives. www4.ps-sp.gc.ca/en/library/publications/economic/invest/cost.html; 1996.
10. Gatti U, Vitaro F, Tremblay RE. Iatrogenic effects of juvenile justice: GRIP, University of Montreal; 2008:27.
11. Schweinhart L, Montie J, Xiang Z, Barnett WS, Belfield CR, Nores M. *Lifetime effects: The High/Scope Perry Preschool study through age 40*. Vol 14. Ypsilanti, MI: High/Scope Press; 2005.
12. Dodge KA, Dishion TJ, Lansford JE. Deviant peer influences in programs for youth: *Problems and solutions* New York, N.Y.: Guilford Press; 2006.
13. Piquero A, Farrington DP, Welsh B, Tremblay RE, Jennings W. *Effects of Early Family/Parent Training Programs on Antisocial Behavior & Delinquency. A systematic Review :: Swedish National Council for Crime Prevention*; 2008.
14. Glazier L. It's a girl's world. National Film Board of Canada, 2004.
15. Tremblay RE, Boulerice B, Harden PW, et al. Do children in Canada become more aggressive as they approach adolescence? In: Human Resources Development Canada, Statistics Canada, eds. *Growing up in Canada: National Longitudinal Survey of Children and Youth*. Ottawa: Statistics Canada; 1996:127-137.
16. Lewis M, Alessandri SM, Sullivan MW. Violation of expectancy, loss of control, and anger expressions in young infants. *Developmental Psychology*. 1990;26(5):745-751.
17. Tremblay RE, Japel C, Pélusé D, et al. The search for the age of "onset" of physical aggression: Rousseau and Bandura revisited. *Criminal Behavior and Mental Health*. 1999;9(1):8-23.
18. Alink LR, Mesman J, van Zeijl J, et al. The Early Childhood Aggression Curve: Development of Physical Aggression in 10- to 50-Months-Old Children. *Child Development*. 2006;77(4):954-966.
19. National Institute of Child Health and Human Development (NICHD), Early child Care Research Network. Trajectories of physical aggression from toddlerhood to middle school: predictors, correlates, and outcomes. *Monographs of the Society for Research in Child Development*. 2004;69(4): serial 278.
20. Institut de la Statistique du Québec. *Longitudinal study of child development in Québec (unpublished data), 1998-2002*. Québec: Institut de la Statistique du Québec.
21. Choquet M, Ledoux S. *Adolescents: Enquête nationale*. Paris: Les éditions INSERM; 1994.
22. Nagin D, Tremblay RE. Trajectories of boys' physical aggression, opposition, and hyperactivity on the path to physically violent and non violent juvenile delinquency. *Child Development*. 1999;70(5):1181-1196.
23. Cairns RB, Cairns BD, Neckerman HJ, Ferguson LL, Gariépy JL. Growth and aggression: I. Childhood to early adolescence. *Developmental Psychology*. 1989;25(2):320-330.
24. Broidy LM, Nagin DS, Tremblay RE, et al. Developmental trajectories of childhood disruptive behaviors and adolescent delinquency: A six site, cross national study. *Developmental Psychology*. 2003;39(2):222-245.
25. Côté S, Vaillancourt T, Barker ED, Nagin D, Tremblay RE. The joint development of physical and indirect aggression: Predictors of continuity and change in the joint development of physical and indirect aggression. *Development and Psychopathology*. 2007;19(1):37-55.

26. Dionne G. Language development and aggressive behavior. In: Tremblay RE, Hartup WW, Archer J, eds. *Developmental origins of aggression*. New York: Guilford; 2005.
27. Peterson JB, Flanders JL. Play and the regulation of aggression. In: Tremblay RE, Hartup WH, Archer J, eds. *Developmental origins of aggression*. New York: Guilford Press; 2005:470.
28. Tremblay RE. Why socialization fails? The case of chronic physical aggression. In: Lahey BB, Moffitt TE, Caspi A, eds. *Causes of conduct disorder and juvenile delinquency*. New York: Guilford Publications; 2003:182-224.
29. Lacourse E, Nagin DS, Vitaro F, Côté S, Arseneault L, Tremblay RE. Prediction of early onset deviant peer group affiliation: A 12 year longitudinal study. *Archives of General Psychiatry*. 2006;63(5):562-568.
30. Côté S, Vaillancourt T, LeBlanc JC, Nagin DS, Tremblay RE. The development of physical aggression from toddlerhood to pre-adolescence: A nation wide longitudinal study of Canadian children. *Journal of Abnormal Child Psychology*. 2006;34(1):71-85.
31. Raymond M. *High school dropouts returning to school*. Ottawa, ON: Statistics Canada division's Culture, Tourism and the Centre for Education. April 2008. 81-595-M. Available at: www.statcan.ca/english/research/81-595-MIE/81-595-MIE2008055.htm.
32. McCaul EJ, Donaldson GA, Coladarci T, Davis WE. Consequences of dropping out of school: Findings from high-school and beyond. *Journal of Educational Research*. 1992;85(4):198-207.
33. Rothwell N, Turcotte M. The influence of education on civic engagement: Differences across Canada's rural-urban spectrum. *Rural and Small Town Canada Analysis Bulletin*. Vol 7. Statistics Canada. Catalogue no.21-006-HIE. Available at: dsp-psd.tpsgc.gc.ca/Collection/Statcan/21-006-X/21-006-XIE2006001.pdf ed; 2006:18.
34. Human Resources and Labour Canada. *Leaving School - Results From a National Survey Comparing School Leavers and High School Graduates 18 to 20 Years of Age*. Ottawa, ON: Human Resources and Labour Canada; 1993.
35. Vitaro F, Brendgen M, Larose S, Tremblay RE. Kindergarten disruptive behaviors, protective factors, and educational achievement by early adulthood. *Journal of Educational Psychology*. 2005;97(4):617-629.
36. Cairns RB, Cairns BD. *Life lines and risks: Pathways of youth in our time*. New York: Cambridge University Press; 1994.
37. Barker ED, Séguin JR, White HR, et al. Development trajectories of physical violence and theft: relations to neuro-cognitive performance. *Archives of General Psychiatry*. 2007;64(5):592-599.
38. Séguin JR, Arseneault L, Boulerice B, Harden PW, Tremblay RE. Response perseveration in adolescent boys with stable and unstable histories of physical aggression: The role of underlying processes. *Journal of Child Psychology and Psychiatry*. 2002; 43(4):481-494.
39. Ladd GW, Troop-Gordon W. The role of chronic peer difficulties in the development of children's psychological adjustment problems. *Child Development*. 2003; 74(5):1344-1367.
40. Jimerson S, Egeland B, Sroufe LA, Carlson B. A prospective longitudinal study of high school dropouts examining multiple predictors across development. *Journal of School Psychology*. 2000; 38(6):525-549.
41. Campbell S, B., Spieker S, Burchinal M, Poe MD, NICHD Early Child Care Research Network. Trajectories of aggression from toddlerhood to age 9 predict academic and social functioning through age 12 *Journal of Child Psychology and Psychiatry and Allied Disciplines*. 2006;47(8):791-800.
42. Baillargeon RH, Zoccolillo M, Keenan K, et al. Gender differences in physical aggression: A prospective population-based survey of children before and after 2 years of age. *Developmental Psychology*. 2007;43(1):13-26.
43. Archer J, Côté S. Sex differences in aggressive behavior: A developmental and evolutionary perspective. In: Tremblay RE, Hartup WH, Archer J, eds. *Developmental origins of aggression*. New York: Guilford Press; 2005.
44. Côté S. Sex differences in physical and indirect aggression: A developmental perspective. *European Journal of Criminal Policy Research*. 2007;13(3-4):183-200.
45. Nagin DS, Tremblay RE. Parental and early childhood predictors of persistent physical aggression in boys from kindergarten to high school. *Archives of General Psychiatry*. 2001;58(4):389-394.
46. Tremblay RE, Nagin D, Séguin JR, et al. Physical aggression during early childhood: Trajectories and predictors. *Pediatrics*. 2004;114(1):e43-e50.
47. Keenan K, Shaw DS. The development of aggression in toddlers: A study of low-income families. *Journal of Abnormal Child Psychology*. 1994;22(1):53-77.

48. Dionne G, Tremblay RE, Boivin M, Laplante D, Périusse D. Physical aggression and expressive vocabulary in 19 month-old twins. *Developmental Psychology*. 2003;39(2):261-273.
49. Brendgen M, Dionne G, Girard A, Boivin M, Vitaro F, Périusse D. Examining genetic and environmental effects on social aggression: A study of 6-year-old twins. *Child Development*. 2005;76(4):930-946.
50. Caspi A, McClay J, Moffitt T, et al. Role of genotype in the cycle of violence in maltreated children. *Science*. 2002;297:851-854.
51. Widom CS. The cycle of violence. *Science*. 1989;16(244):160-166.
52. Shaw D. Parenting programs and their impact on the social and emotional development of young children. In: Centre of Excellence for Early Childhood Development (CEECD) Encyclopedia on Early Childhood Development. Available online at: www.child-encyclopedia.com/Pages/PDF/ShawANGxp-Parenting.pdf.
53. Dishion TJ. The family ecology of boys' peer relations in middle childhood. *Child Development*. 1990;61(3):874-892.
54. Rubin KH. Parents of aggressive and withdrawn children. In: Bornstein MH, ed. *Handbook of parenting, Vol. 1: Children and parenting*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1995:255-284.
55. Belsky J, Jaffee SR. The multiple determinants of parenting. In: Cicchetti D, Cohen DJ, eds. *Developmental Psychopathology, Vol. 3: Risk, Disorder, and Adaptation (2nd Ed.)*. Hoboken, NJ: John Wiley & Sons, Inc; 2006:38-85.
56. Tremblay RE. Understanding development and prevention of chronic physical aggression: Towards experimental epigenetic studies. *Philosophical Transactions of the Royal Society of London, Series B: Biological Sciences*. In press.
57. Barr H, Bookstein F, O'Malley K, Connor P, Huggins J, Streissguth A. Binge drinking during pregnancy as a predictor of psychiatric disorders on the structured clinical interview for DSM-IV in young adult offspring. *American Journal of Psychiatry*. 2006;163(6):1061-1065.
58. Behnke M, Eyler F, Warner T, Garvan C, Hou W, Wobie K. Outcome from a prospective, longitudinal study of prenatal cocaine use: Preschool development at 3 years of age. *Journal of Pediatric Psychology*. Special Issue: Prenatal Substance Exposure: Impact on Children's Health, Development, School Performance, and Risk Behavior. 2006;31(1):41-49.
59. Olson H, Streissguth A, Sampson P, Barr HM, Bookstein F, Thiede K. Association of prenatal alcohol exposure with behavioral and learning problems in early adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry*. 1997;36(9):1187-1194.
60. Wakschlag L, Pickett K, Kasza K, Loeber R. Is prenatal smoking associated with a developmental pattern of conduct problems in young boys? *Journal of the American Academy of Child & Adolescent Psychiatry*. 2006;45(4):461-467.
61. Brennan PA, Grekin ER, Mednick SA. Maternal smoking and criminal outcomes. *Archives of General Psychiatry*. 1999;56:215-219.
62. Fergusson DM, Horwood LJ, Lynskey MT. Maternal smoking before and after pregnancy: Effects on behavioral outcomes in middle childhood. *Pediatrics*. 1993;92:815-822.
63. Huijbregts SCJ, Séguin JR, Zoccolillo M, Boivin M, Tremblay RE. Associations of maternal prenatal smoking with early childhood physical aggression, hyperactivity-impulsivity, and their co-occurrence. *Journal of Abnormal Child Psychology*. 2007; 35:203-215.
64. Ernst M, Moolchan ET, Robinson ML. Behavioral and neural consequences of parental exposure to nicotine. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2001;40:630-641.
65. Kagan J, Fox N. *Biology, culture, and temperamental biases*. Hoboken, NJ: John Wiley & Sons Inc.; 2006.
66. Boisjoli R, Vitaro F, Lacourse E, Barker ED, Tremblay RE. Impact and Clinical Significance of a Preventive Intervention for Disruptive Boys: 15 year follow-up. *British Journal of Psychiatry*. 2007; 191:415-419.
67. Lacourse E, Côté S, Nagin DS, Vitaro F, Brendgen M, Tremblay RE. A longitudinal-experimental approach to testing theories of antisocial behavior development. *Development & Psychopathology*. 2002;14:909-924.
68. Tremblay RE, Kurtz L, Mâsse LC, Vitaro F, Pihl RO. A bimodal preventive intervention for disruptive kindergarten boys: Its impact through mid-adolescence. *Journal of Consulting and Clinical Psychology*. 1995;63(4):560-568.
69. Liu J, Raine A, Venables P, Mednick S. Malnutrition at age 3 years and externalizing behavior problems at ages 8, 11, and 17 years. *American Journal of Psychiatry*. 2004;161(11):2005-2013.

70. LeMarquand DG, Pihl RO, Young SN, et al. Tryptophan depletion, executive functions, and disinhibition in aggressive adolescent males. *Neuropsychopharmacology*. 1998;19(4):333-341.
71. Stadler C, Schmeck K, Nowraty I, Müller W, Poustka F. Platelet 5-HT uptake in boys with conduct disorder. *Neuropsychobiology*. 2004;50(3):244-251.
72. Pihl RO, Benkelfat C. Neuromodulators in the development and expression of inhibition and aggression. In: Tremblay RE, Hartup WW, Archer J, eds. *Developmental origins of aggression*. New York: Guilford; 2005:261-280.
73. O'Connor T. The persisting effects of early experiences on psychological development. In: Cicchetti D, Cohen DJ, eds. *Developmental psychopathology, Vol. 3: Risk, disorder, and adaptation (2nd ed.)*. Hoboken, NJ: John Wiley & Sons, Inc.; 2006:202-234.
74. Côté S, Boivin M, Nagin DS, et al. The role of maternal education and non-maternal care services in the prevention of children's physical aggression. *Archives of General Psychiatry*. 2007;64(11):1305-1312.
75. Reynolds A, Temple J, Robertson D, Mann E. Long-term effects of an early childhood intervention on educational achievement and juvenile arrest: A 15-year follow-up of low-income children in public schools. *Journal of the American Medical Association*. 2001;285:2339-2346.
76. Panksepp J. *Affective neuroscience: The foundations of human and animal emotions*. New York: Oxford University Press; 1998.
77. Tremblay RE. *The Montreal Longitudinal and Experimental Study: The Intervention Program and Its Long Term Effects*. Montréal, QC: GRIP, Research Unit on Children's Psychosocial Maladjustment (GRIP) & University of Montreal; 2008.
78. Vitaro F, Brendgen M, Pagani L, Tremblay RE, McDuff P. Disruptive behavior, peer association, and conduct disorder: Testing the developmental links through early intervention. *Development and Psychopathology*. 1999;11:287-304.
79. Patterson GR, Reid JB, Jones RR, Conger RR. *A social learning approach to family intervention: Families with aggressive children*. (Vol. 1) Eugene, OR: Castalia; 1975.
80. Webster-Stratton C, Reid MJ. The incredible years parents, teachers and children training series: A multifaceted treatment approach for young children with conduct problems In: Kazdin AE, Weisz JR, eds. *Evidence-based psychotherapies for children and adolescents*. New York, NY: Guilford Press; 2003:224-240.
81. Lochman JE, Wells KC. A social cognitive intervention with aggressive children: Prevention effects and contextual implementation issues. In: Peters RDV, McMahon RJ, eds. *Preventing childhood disorders, substance abuse and delinquency*. Thousand Oaks, CA: Sage; 1996:111-143.
82. Strayhorn JM, Weidman CS. A parent practices scale and its relation to parent and child mental health. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1989;27(5):613-618.
83. Olds DL, Eckenrode J, Henderson CR, Jr., et al. Long-term effects of home visitation on maternal life course and child abuse and neglect: Fifteen-year follow-up of a randomized trial. *Journal of the American Medical Association*. 1997;278:637-643.
84. Olds D, Henderson CR, Cole R, et al. Long-term effects of nurse home visitation on children's criminal and antisocial behavior: Fifteen-year follow-up of a randomized controlled trial. *Journal of the American Medical Association*. 1998;280(14):1238-1244.
85. Olds DL, Robinson J, O'Brien R, et al. Home visiting by nurses and by paraprofessionals: A randomized controlled trial. *Pediatrics*. 2002; 110(3):486-496.
86. Olds D. Prenatal and infancy home visiting by nurses: From randomized trials to community replication. *Prevention Science*. 2000;3(3):153-172.
87. Webster-Stratton C. Preventing conduct problems in Head Start Children: Strengthening parenting competencies. *Journal of Consulting & clinical Psychology*. 1998;66(5):715-730.
88. Schweinhart LL, Barnes HV, Weikart DP. *Significant benefits. The High/Scope Perry School Study through age 27*. Ypsilanti, MI: High/Scope Press; 1993.
89. Wilson SJ, Lipsey MW. School-based interventions for aggressive and disruptive behavior. Update of a meta-analysis. *American Journal of Preventive Medicine*. 2007; 33(2S):S130-143.
90. Webster-Stratton C, Reid M, Hammond M. Treating children with early-onset conduct problems: Intervention outcomes for parent, child, and teacher training. *Journal of Clinical Child and Adolescent Psychology*. 2004;33(1):105-124.
91. Tremblay RE, Mâsse LC, Pagani L, Vitaro F. From childhood physical aggression to adolescent maladjustment: The Montréal Prevention Experiment. In: Peters RD, McMahon RJ, eds. *Preventing childhood disorders, substance abuse and delinquency*. Thousand Oaks, CA: Sage; 1996:268-298.

The Centre of Excellence for Early Childhood Development (CEECD) is one of four Centres of Excellence for Children's Well-being. The Centres of Excellence are funded by the Public Health Agency of Canada.

The mandate of the CEECD is to foster the dissemination of scientific knowledge on the social and emotional development of young children and on the policies and services that influence this development. It also includes formulating recommendations on the services needed to ensure optimum early childhood development.

www.excellence-earlychildhood.ca

The Early Childhood Learning Knowledge Centre is one of five knowledge centres established in various domains by the Canadian Council on Learning.

The Canadian Council on Learning is an independent, not-for-profit corporation funded through an agreement with Human resources and Social Development Canada. Its mandate is to promote and support evidence-based decisions about learning throughout all stages of life, from early childhood through to senior years.

www.ccl-cca.ca/childhoodlearning



CENTRES OF EXCELLENCE FOR CHILDREN'S WELL-BEING

Early Childhood Development



CANADIAN COUNCIL
ON LEARNING

CONSEIL CANADIEN
SUR L'APPRENTISSAGE

EARLY CHILDHOOD LEARNING KNOWLEDGE CENTRE



CENTRES OF EXCELLENCE FOR CHILDREN'S WELL-BEING

Early Childhood Development

© 2008 Centre of Excellence
for Early Childhood Development