

Violent Boys: Development and Prevention

Research Unit on Children's Psychosocial Maladjustment, Faculté des Arts et des Sciences, Université de Montréal, 750 Gouin Boulevard East, Montreal, Quebec H2C 1A6. Telephone: (514) 385-2525.

Over the last 20 years, longitudinal research⁽¹⁾ has shown that the majority of teenage and adult males who are frequently violent displayed aggressiveness as young boys. However, this research also shows that not all violent boys grow up to be violent teenagers and adults. In fact, more than half of boys who are most aggressive between ages 8 and 10 do not grow up to become particularly violent adults.

It was on the basis of these results that, in 1984, we undertook a longitudinal study of a cohort of 916 francophone kindergarten-aged boys from underprivileged backgrounds in Montreal. We hoped to learn more about the factors that cause some boys to remain aggressive into their teenage years. The study would provide an opportunity to follow the development of behavioural patterns in high-risk boys, and would help identify those boys who naturally outgrow their aggressive behaviour and do not require preventive intervention.

To achieve these goals, we had to keep track of a number of variables on a regular basis. Given the resources at our disposal, efforts were made to use as many theoretical and methodological perspectives as possible. Data on the boys came from various sources: direct observations by researchers; interviews; tests and questionnaires filled out by the boys, their parents, peers and teachers; and official records of different organizations (schools, social services, courts).

Direct observation of the boys' behaviour with their parents, their peers and their teachers took place at school, in the home and in a laboratory which permitted researchers to observe families in standardized conditions.

This allowed us to describe the evolution of the boys' interactions with others (parents, teachers and peers) and to examine the perceptions that the boys' parents, teachers and peers, as well as the boys themselves, had of these behavioural patterns.

Finally, through tests, questionnaires and interviews, it was possible to trace the boys' cognitive development, academic performance, temperament, physical growth, nutritional habits and physiological reactivity, as well as their home environment and the marital harmony, personality and intelligence quotient of their parents.⁽²⁾

In addition to drawing a profile of the boys' development in their daily environment, we wanted to study the results of preventive intervention. In particular, we wanted to evaluate two types of help for the most aggressive kindergarten-aged boys to reduce aggressive behaviour during their primary-school years.

The two particular types of help -parenting training for the parents and social skills training for the boys - seemed to be the most appropriate measures because they directly target two of the perceived causes of aggressive behaviour: inefficient parental disciplinary practices and a repertoire of antisocial behavioural

patterns on the boys' part.

Although the first part of the study is descriptive, testing the effectiveness of a preventive intervention follows standard experimental procedure. First, the most aggressive boys in kindergarten were identified. Then they were randomly divided into three equal groups: an experimental group which was subject to the intervention, an observation group (or rather a placebo-attention group) which was subject to the intensive observations described above but not the intervention, and a control group which was subject to neither interventions nor intensive observations.⁽³⁾

This method made it possible to evaluate the benefits of the preventive treatment by comparing the experimental group to the control group. A comparative study of the observation group and the experimental group determined whether the changes in the latter were a result of the actual treatment or a by-product of the attention the group had received. Finally, by comparing the control group and the observation group, researchers were able to determine whether intensive observation of these boys, occurring over several years, had a positive or negative effect. At present, opinions on this point are divided. Conclusions reached by this study may shed some empirical light on the debate.

From the beginning, the study sample was restricted to kindergarten aged boys from underprivileged backgrounds attending schools under the jurisdiction of the Montreal Catholic School Board (MCSB). This particular sample was chosen because previous studies had shown that boys from underprivileged backgrounds are more likely to resort to aggressive behaviour.⁽⁴⁾

In 1986 and 1987, we undertook similar studies of four different groups. One sample represented all boys and girls attending kindergarten in francophone public schools throughout the province of Quebec. The three other samples represented boys and girls attending kindergarten in three different-sized cities - Montreal, Quebec City and Val d'Or. Distribution of Physically Violent Boys in Quebec's Kindergarten Classes The data on aggressive behavioural patterns in kindergarten-aged children were compiled from evaluations done by kindergarten teachers. Since these teachers are in daily contact with the children for several months, they are able to identify those who display the most extreme behaviour. Although these data are bound to be somewhat biased, validity and accuracy checks of this evaluation method have shown it to be one of the most effective ways of tracing aggressive behaviour in children at school.⁽⁵⁾

The identification of physically aggressive children was based on three behaviours: fighting; bullying; and kicking, biting and hitting.⁽⁶⁾

The study of samples of boys and girls attending schools in different school boards throughout Quebec confirmed what other studies⁽⁷⁾ had already found: the incidence of violent behaviour was higher among young boys than among young girls. According to observations, 14% of boys but only 4.4% of girls frequently displayed physically violent behaviour. This difference remains fairly constant regardless of the children's ages,⁽⁸⁾ which explains why researchers who study violent behaviour concentrate their efforts on males.

A study of the distribution of boys who frequently show violent behavioural patterns revealed that these boys were not evenly distributed throughout the province. There was a higher concentration of violent

kindergarten-aged boys in Montreal (19.2%), particularly in the schools in the Montreal Catholic School Board, which receive children from underprivileged backgrounds (26.8%).⁽⁹⁾

Because the sample was limited to boys attending school in the MCSB jurisdiction, whose parents were all francophones born in Canada, an ethnic factor cannot be used to explain the high incidence of aggressive behaviour. Family Traits of Violent Kindergarten-Aged Boys Several studies⁽¹⁰⁾ have shown that certain family traits are frequently associated with aggressive or antisocial behaviour. Some researchers⁽¹¹⁾ have therefore suggested that violent behaviour originates in the family environment.

The scope of our research did not include direct study of early behaviour learning which takes place before the child attends kindergarten. However, we observed certain factors that permitted a more accurate identification of those families whose sons are likely to display violent behaviour in kindergarten.

A comparative study of frequently violent and non-violent boys in Quebec showed that the level of schooling of parents of violent boys was slightly lower than that of the parents of nonviolent boys. Furthermore, 21.4% of the boys whose parents had split up (broken family) at some time between the boy's birth and the end of kindergarten displayed violent behaviour. Only 11.6% of boys whose parents were still together (intact family) showed similar behaviour.

This trend, which was consistent throughout all schools in Montreal as well as in schools under the jurisdiction of the Montreal Catholic School Board (which receive children from underprivileged backgrounds), is evidently the result of a combination of factors. Boys from broken families attending MCSB schools were almost twice as likely to be perceived as violent than their counterparts from intact families (39.2% versus 20.5%). They were also twice as likely to be considered violent as boys from broken families who attended school elsewhere in the province (21.4%), and almost four times more likely than boys from intact families elsewhere in Quebec (11.6%).

Other family factors linked to frequent aggressive behaviour in children were studied, including number of siblings, day care experience and the parents' ages at the time of the child's birth.

An analysis of the number of siblings in the provincial sample shows that the incidence of violent behaviour was higher among boys who had no siblings when they began kindergarten (21.2%) than among children with one (12.7%), two (9.9%) or three or more (10.2%) brothers or sisters. This trend was also found among boys attending MCSB schools which receive children from underprivileged backgrounds, although the differences were not quite as significant.

Results throughout the province, in Montreal and in schools under the jurisdiction of the MCSB all show that boys who had never attended day care were less likely to be among the most violent boys in kindergarten. The association between placement in day care and physical violence was much greater for boys attending MCSB schools than for boys in the other samples.

This observation warrants further investigation, although research in the United States⁽¹²⁾ came to similar conclusions. In a critical review of these studies, Belsky⁽¹³⁾ suggests that families whose children display

behavioural difficulties have a greater tendency to place their children in day care while they are still infants.

The results from an analysis of the mothers' ages at the time of their sons' births confirm another phenomenon that has been previously observed, this time by researchers studying teenage mothers:⁽¹⁴⁾ the incidence of adjustment difficulties is higher among children of teenage mothers. The mothers of violent boys were more likely to have been younger than 21 at the time of their sons' births than to have been 21 or older. These results are consistent throughout the province, in Montreal and in schools under the jurisdiction of the MCSB.

Surprisingly, we were unable to find an association between the age of the mother at the time of birth and the level of anxiety in the child.⁽¹⁵⁾ One would have expected that the adversity resulting from teenage maternity could not only have a negative effect on the child's externalizing behaviour (aggressiveness), but also cause behavioural inhibition (anxiety). However, our results have shown that the negative impact of teenage maternity is expressed in terms of aggressive behaviour of the child. It will be important in the near future to explain the mechanism that leads from teenage mothering to male aggressive behaviour. **What Becomes of Boys Who Maintain Physically Aggressive Behaviour Beyond Kindergarten?** In many cases, aggressive behaviour in kindergarten is temporary, resulting from the child having to adapt to a new environment. It can also be a continuation of behavioural patterns frequently displayed by young children. The longitudinal study, in a school setting, of boys from underprivileged backgrounds in Montreal provides an opportunity to examine differences between the boys who temporarily displayed aggressive behaviour in kindergarten and the boys who consistently displayed aggressive behaviour beyond kindergarten. Both groups were compared to a third group of boys who, according to their teachers, had never displayed violent behaviour.

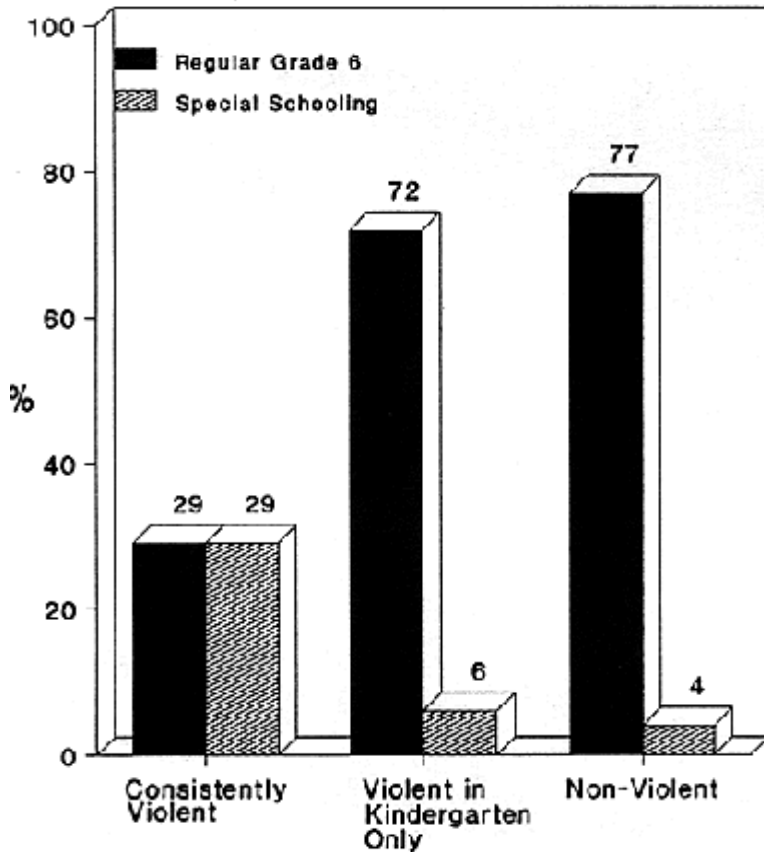
Results clearly show that boys who displayed violent behaviour all through primary school (consistently violent) face considerable difficulties when it comes to academic and social adaptation. Of the 785 boys attending the MCSB schools who were followed up to the age of 12, 6.2% (n=49) still ranked among the most violent boys at the ages of 10, 11 and 12, just as they had in kindergarten.

The analysis of these boys' academic status at the age of 12 (i.e., six years after kindergarten) indicated that only 29% of them attended regular grade six classes (Figure 1). Another 29% were being schooled in special environments (class, school, boarding school, etc.) specifically geared to children with learning disabilities, behaviour disorders or family troubles.

In contrast, boys perceived as violent in kindergarten but no longer regarded as such at the ages of 10, 11 and 12 were twice as likely to be attending regular grade six classes at the age of 12 (72%), and almost five times less likely to have been placed in a special environment (6%).

Figure 1

Figure 1
Academic Standing of Three Groups
of Boys Six Years After Kindergarten

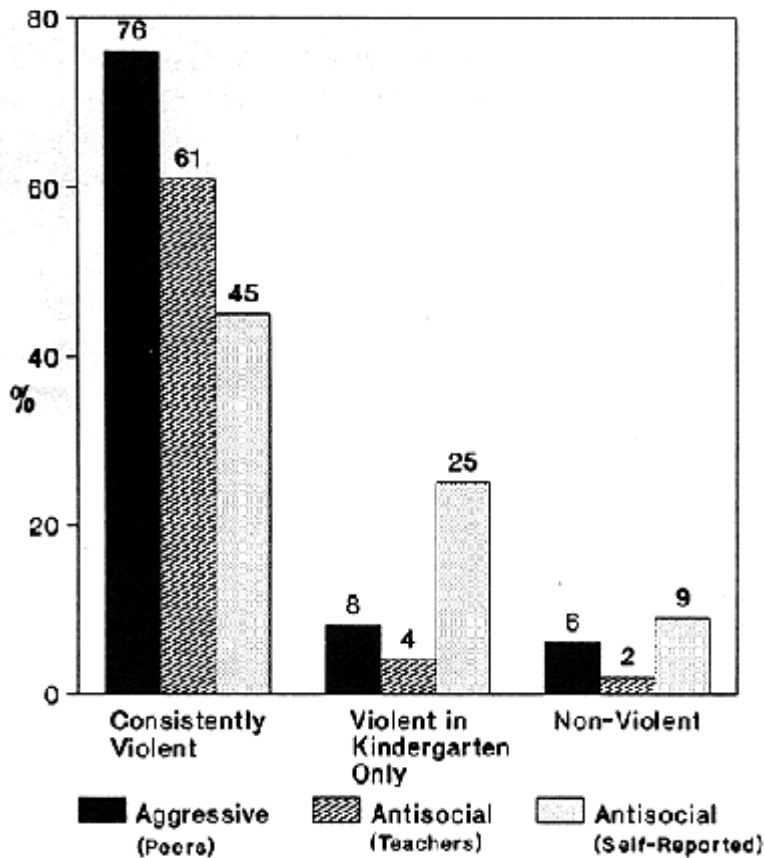


These boys were no more likely to suffer from adaptation difficulties in school than boys who were identified by their teachers as never having displayed violent behaviour.

The boys perceived as consistently violent by their teachers, from kindergarten to age 12, were generally regarded as aggressive by their peers. These boys also ran the risk of adopting a delinquent lifestyle as early as age 10, 11 or 12. We observed (Figure 2) that between ages 10 and 12, 76% of these consistently violent boys were perceived by their peers as being among the most aggressive members of the class.

Figure 2

Figure 2
Aggressive and Antisocial Boys
as Perceived by Peers, Teachers
and Themselves



In comparison, only 8% of boys perceived as violent in kindergarten but no longer violent at age 12, and 6% of boys never perceived as violent, were thought by their classmates to be among the most aggressive in the class. Teachers' impressions of violent behaviour in certain boys were corroborated to a large extent by the opinion of the boys' peers.

We also observed that a majority of consistently violent boys (61%) aged 10 to 12 were perceived by their teachers as displaying such other antisocial behaviour as stealing, lying or truancy. This compares with only 2% of non-violent boys and 4% of boys who had been regarded by their teachers as violent only at age 6.

These teacher and peer evaluations were largely confirmed by information provided by the boys themselves regarding their delinquent activities between the ages of 10 and 12. Almost half (45%) of consistently violent boys reported committing delinquent acts (theft, vandalism, aggression, alcohol and drug use) which placed them among the most delinquent boys aged 10 to 12 in the sample.

In contrast, 25% of the boys perceived as violent only in kindergarten fell into this category of most delinquent boys aged 10 to 12. It should also be noted that only 9% of boys perceived as non-violent from kindergarten to the ages of 10 to 12 fell into this category.

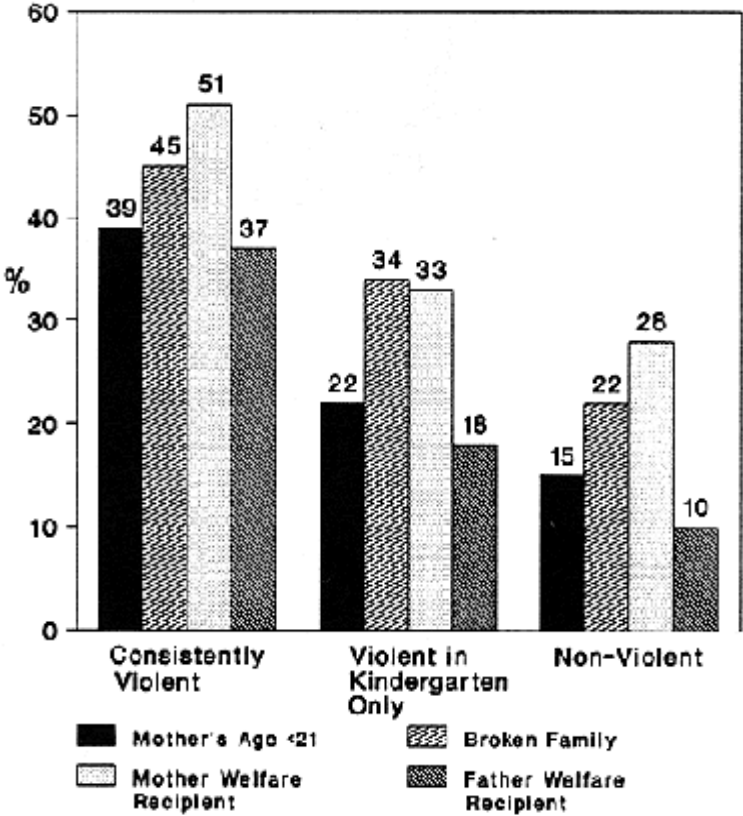
These results clearly show that young children who display violent behaviour run a high risk of

becoming deeply involved in delinquent activities before their teenage years. Characteristics of Boys Violent from Age 6 to 12 As mentioned previously, boys who display violent behaviour in kindergarten show different environmental characteristics - family traits in particular - than non-violent boys. For prediction purposes, it is important to study to what extent certain characteristics separate boys who will remain violent from boys who will stop their aggressive behaviour. We observed that the family traits that predict violent behaviour in kindergarten also predict its continuity.

As seen in Figure 3, 45% of consistently violent boys come from broken families. These boys' mothers (51%) and fathers (37%) were more likely to be welfare recipients. In 39% of these cases, the mothers were younger than 21 at the time of their sons' births.

Figure 3

**Figure 3
Family Characteristics of Boys**



These results indicate that consistently violent boys were more likely to come from broken families headed by a young woman whose financial situation was unstable and who was 20 years of age or younger when she had her son.

The use of a family adversity index,⁽¹⁶⁾ based on these family environment variables, clearly shows that consistently violent boys come from families where adversity runs high. Also, a study of the boys' temperaments,⁽¹⁷⁾ as described by their mothers, shows that the boys most likely to display violent

behaviour were described as being more reactive, meaning they tended to react more strongly to various stimuli and were prone to hyperactivity.

In all likelihood, boys with a highly reactive neurological system who live in an unstable environment are the most likely to display aggressive behaviour on a continuing basis.⁽¹⁸⁾ Can the Continuity of Violent Behaviour in Primary School-Aged Boys Be Prevented? If it is possible to identify, right from kindergarten, the children most likely to become and remain violent, the school environment can become the focal point for the co-ordination of prevention efforts, since all children must attend school. School is an appropriate place to seek out those children who experience particular difficulties in acquiring the knowledge and behavioural patterns that will allow them to function in society.

The research program that we undertook included the testing of an intervention program designed to help parents reduce their sons' aggressive behaviour. The program was also aimed at helping the boys by encouraging them to display positive behavioural patterns when relating to their peers rather than resorting to violence as a way of resolving conflicts.

The intervention program for parents and boys took place over two years. The boys were 7 years old when the intervention began. Between the end of kindergarten and the beginning of second grade, we trained the staff who would carry out the intervention (four university-trained childcare workers, a psychologist and a social worker). We also undertook all necessary evaluations before the implementation of the intervention program (evaluation of the parents' behaviour with their sons, evaluation of the child's behaviour at home and at school).

Interventions aimed at the boys were carried out at school, in small groups. These groups included children who did not display behavioural difficulties and who served as role models. Interventions directed at the parents took place at home with both parents present or, in the case of single-parent families, one parent present.

The behaviour of all boys (experimental, control and observation groups) was evaluated at ages 9, 10, 11 and 12.

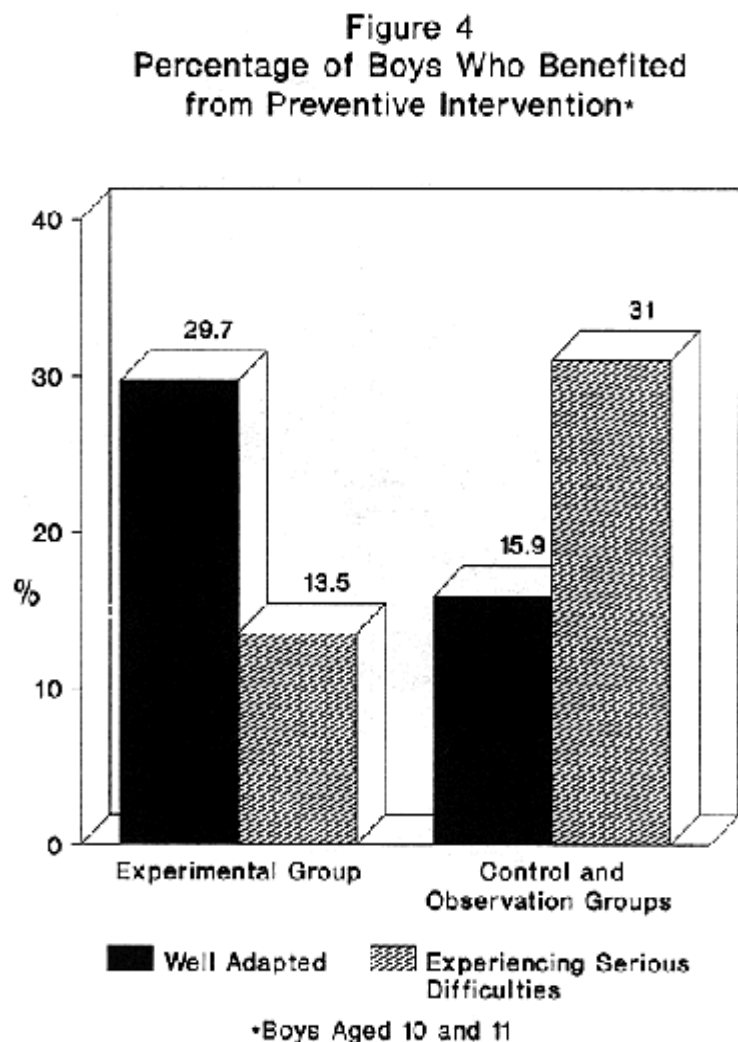
Based on results to date,⁽¹⁹⁾ the effect of the intervention appears positive. In a comparative study of the experimental group, the control group and the observation group undertaken two years after the end of the intervention, fewer boys from the experimental group reported having fought either at home or away from home, and fewer reported having stolen from their home. The number of boys who had repeated a grade or been transferred into a special class or institution for children with difficulties was also lower.

An index was established to compare the overall adaptation of each child within the school environment. This index is based on peer and teacher evaluations of aggressive, oppositional and hyperactive behavioural patterns in 10- and 11-year-old boys and on their being or not being in a regular sixth grade class six years after kindergarten. The index determines which boys show serious difficulties in terms of behaviour and academic performance.

Results (Figure 4) show that 14% of boys in the experimental group, compared with 31% in the control

and observation groups, had behavioural and academic performance problems.

Figure 4



Although these results are encouraging, no difference was noted between the experimental group and the control and observation groups on several other variables indicative of adaptation difficulties. For the time being, we prefer to reserve judgment on the effectiveness of the preventive treatment. Over the next five years, the boys will be in a range of age (13 to 18) during which they are most likely to commit delinquent acts, especially physically violent acts. This evaluation period should shed some light on the long-term effects of this preventive intervention in the case of aggressive, violent, kindergarten-aged boys. Conclusion Physical violence is everyone's concern. Physical aggression displayed by kindergarten-aged boys is linked to several social issues such as poverty, teenage pregnancy, divorce and day care.

In all likelihood, modern society will not be able to resolve these issues without putting considerable energy into bettering the quality of life of these children who are tomorrow's parents. Given that seniors, who have legitimate needs, are a growing segment of society, we will have to choose between directing resources toward the health and welfare of an aging population or committing resources for the care of the poorest children.

The welfare of seniors can be heightened by increasing police surveillance to prevent aggressions. However, the same end can be achieved by providing better services to those children who are likely to become delinquent. In a society with unlimited resources, all prevention strategies could be used. However, we are far from being in such a society.

The politicians and managers who must decide which course of action to take are influenced by several factors. These include humanitarian considerations (e.g., the welfare of minorities) and political considerations (e.g., majority vote). One of the purposes of research is to provide facts on which to base the decision-making process.

Unfortunately, very little research has been done on the causes and prevention of psychosocial adaptation difficulties. At present, there is no way to tell whether investing in preventive treatment for high-risk children will yield results significant enough to match the resources invested. Until now, the resources allotted to helping children with problems have been used to create services, but the short-, medium- and long-term effectiveness of these services is unknown.

Experimental and epidemiological research has brought about significant progress in the physical health field over the last few decades. It is to be hoped that the systematic application of these methods will promote a better understanding of how to keep children out of such living conditions that they turn to violence to get what they want.

The results of preventive intervention at the beginning of the primary-school years have shown that helping both the parents and the children can sometimes have a positive effect. Nonetheless, research has also shown that a much earlier intervention, before aggressive behavioural patterns become ingrained, is preferable. These preventive interventions imply the identification of high-risk children during pregnancy or within a few months of birth. However, these evaluation methods are far more complex and costly than identification in the school.

To take advantage of the opportunity for early intervention provided by the school system, the children we study must be viewed as future parents whose children, in some cases, will be in difficulty. With this perspective, the girls included in the samples become as interesting as the boys, if not more so. The incidence of childhood behavioural difficulties is much lower in girls than in boys, but the girls who have problems are also more likely to become teenage mothers and mothers who provide less than adequate care for their children.⁽²⁰⁾

If early intervention in the cases of young girls who display behavioural difficulties in their primary-school years could be used to lower the teenage pregnancy rate and to raise the quality of care provided to children, the school system would then become a vehicle to prevent the reproduction of adaptation difficulties. It is not unreasonable to expect the school system to prepare youngsters not only for entrance into the work force, but for life in society as well. Acknowledgements The research described in this article was undertaken in co-operation with Pierre Charlebois, Serge Larivée and Marc Leblanc, and made possible by the financial support of several organizations: the Conseil québécois de la recherche sociale, the Social Sciences and Humanities Research Council of Canada, the Fonds pour la formation de chercheurs et l'aide à la recherche (FCAR) of the Government of Quebec, the Department of Health and

Welfare's National Welfare Grants Program, the Conseil de la santé et des services sociaux de la région de Montréal métropolitain, the Fondation Cité des Prairies, the Centre d'accueil Le Mainbourg and the Université de Montréal.

Several professionals and research assistants also took part in this work. We would like to thank Rita Béland, Lucie Bertrand, Michel Bouillon, Lucille David, Lyse Desmarais-Gervais, Raymond Labelle, Danielle Prince, Minh Trinh, Nicole Thériault, Suzanne Langelier, Louise Bineau, Estelle Hébert and, for secretarial support, Mariette Paradis-Choquet and Chantal Bruneau.

A first version of this article was published in the journal *Interface* (April 1990). A modified version appeared in the book *Les enfants agressifs* (Agence d'Arc, 1991), with R.E. Tremblay as editor.

R.E. Tremblay is director of the Groupe de Recherche sur l'Inadaptation Psychosociale chez l'enfant (Research Unit on Children's Psycho-social Maladjustment) and full professor, École de Psycho-Éducation, Université de Montréal.

R.M. Zhou is invited researcher at the Research Unit on Children's Psychosocial Maladjustment of the Université de Montréal and professor at Université Laurentienne.

C. Gagnon is full researcher of the Research Unit on Children's Psychosocial Maladjustment and director of the École de Psycho-Éducation of the Université de Montréal.

F. Vitaro is full researcher of the Research Unit on Children's Psychosocial Maladjustment and associate professor, École de Psycho-Éducation, Université de Montréal.

H. Boileau is statistician of the Research Unit on Children's Psychosocial Maladjustment at the Université de Montréal.

(1)D.P. Farrington, *"Childhood Aggression and Adult Violence: Early Precursors and Later Outcomes,"* in D. Pepler and K. Rubin (Eds.), *The Development and Treatment of Childhood Aggression.* (Hillsdale, N.J.: Lawrence Erlbaum, 1991). See also L. R. Huesmann, L.D. Eron, M.M. Lefkowitz and L.O. Walder, *"Stability of Aggression Over Time and Generations,"* *Developmental Psychology*, 20 (1984): 1120-1134 and also H. Stattin and D. Magnusson, *"The Role of Early Aggressive Behaviour in the Frequency, Seriousness and Types of Later crime,"* *Journal of Consulting and Clinical Psychology*, 57 (1989): 710-718

(2)R.E. Tremblay, P. Charlebois, C. Gagnon and S. Larivée. *Les garçons agressifs à l'école maternelle, étude longitudinale, descriptive, prédictive et explicative.* (Montreal: Groupe de Recherche Interuniversitaire sur la Prévention de l'Inadaptation Psycho-sociale, Université de Montréal, 1987).

(3)R.E. Tremblay, J. McCord, H. Boileau, P. Charlebois, C. Gagnon, M. LeBlanc and S. Larivée, *"can Disruptive Boys be Helped to Become competent?"* *Psychiatry*, 54, May (1991): 148-161.

(4)M. LeBlanc and G. Côté, *"Comparaison des adolescents de 14-15 ans en 1974 et 1985,"* in R.E. Tremblay, M. LeBlanc and A.E. Schwartzman (Eds.), *La conduite délinquante des adolescents à Montréal*

- (1974-1985): Étude descriptive et prédictive. (Montreal: Université de Montréal, École de Psycho-Education, 1986).
- (5) R.B. Cairns, B.D. Cairns, H.J. Neckerman, L.L. Ferguson and J.L. Gariépy, "Growth and Aggression: 1. Childhood to Early Adolescence," *Developmental Psychology*, 25 (1989): 320-330. See also R.E. Tremblay, M. LeBlanc and A.E. Schwartzman, "The Predictive Power of First-grade Peer and Teacher Ratings of Behavior: Sex Differences in Antisocial Behavior and Personality at Adolescence," *Journal of Abnormal Child Psychology*, 16 (1988): 571-583.
- (6) R. Loeber, R.E. Tremblay, C. Gagnon and P. Charlebois, "Continuity and Desistance in Disruptive Boys' Early Fighting at School," *Development and Psychopathology*, 1(1989): 39-50.
- (7) E.E. Maccoby, "Social Groupings in Childhood: Their Relationship to Prosocial and Antisocial Behavior in Boys and Girls," in D. Olweus, J. Block and M. Radke-Yarrow (Eds.), *Development of Antisocial and Prosocial Behavior: Research, Theory and Issues*. (Montreal: Academic Press, 1986).
- (8) J.Q. Wilson and R.J. Herrnstein, *Crime and Human Nature*. (New York: Simon and Schuster, 1985).
- (9) For the complete regional distribution, see R.E. Tremblay, C. Gagnon, F. Vitaro, M. LeBlanc, S. Larivée, P. Charlebois and H. Boileau, "Les garçons agressifs à la maternelle: Qui sont-ils et que deviennent-ils?" in R.E. Tremblay (Ed.), *Les enfants agressifs*. (Montreal: Éditions Agence d'Arc, 1991).
- (10) R. Loeber and M. Stouthamer-Loeber, "Family Factors as Correlates and Predictors of Juvenile Conduct Problems and Delinquency," in M. Tonry and N. Morris (Eds.), *Crime and Justice: An Annual Review*. Vol.7. (Chicago: University of Chicago Press, 1986) 29-149.
- (11) L. Eron, "The Development of Aggressive Behavior from the Perspective of a Developing Behaviorism," *American Psychologist*, 42 (1987): 435-442.
- (12) J. Belsky, "Infant Day care and Socio Emotional Development: The United States," *Journal of Child Psychology and Psychiatry*, 29 (1989): 397-406.
- (13) Ibid.
- (14) C.D. Hayes, *Risking the Future: Adolescent Sexuality, Pregnancy and Child Bearing*. (Washington, D.C.: National Academy Press, 1987).
- (15) R.E. Tremblay and R.M. Zhou, Le dépistage des difficultés d'adaptation sociale chez les garçons de milieux socio-économiques faibles de la maternelle à la fin de l'école primaire. (Montreal: Université de Montréal, Groupe de recherche sur l'inadaptation psycho-sociale chez l'enfant (GRIP), 1991).
- (16) R.E. Tremblay, R. Loeber, C. Gagnon, P. Charlebois, S. Larivée and M. LeBlanc, "Disruptive Boys with Stable and Unstable High Fighting Behavior Patterns During Junior Elementary School," *Journal of Abnormal Child Psychology*, 19 (1991): 285-300.
- (17) R.M. Lerner, M. Palermo, A. Spiro and J.R. Nesselroade, "Assessing the Dimensions of Temperamental Individuality Across the Life Span: The Dimensions of Temperament Survey (DOTS)," *Child Development*, 53 (1982): 149-159.
- (18) P.H. Venables, "Autonomic Nervous Factors in Criminal Behavior," in S.A. Mednick, T.E. Moffitt and S.A. Stack (Eds.), *The Causes of Crime: New Biological Approaches*. (New York: Cambridge University Press, 1987).
- (19) R.E. Tremblay, J. McCord, H. Boileau, M. LeBlanc, P. Charlebois, C. Gagnon and S. Larivée, "The Montreal Prevention Experiment: School Adjustment and Self-reported Delinquency after Three Years of Follow Up." Paper presented at the Annual Meeting of the American Society of Criminology. (Baltimore, November 1990). See also footnote 3.

⁽²⁰⁾L.A. Serbin, A.E. Schwartzman, D.S. Moskowitz and J.E. Ledingham, "Aggressive, Withdrawn and Aggressive-withdrawn Children in Adolescence: Into the Next Generation," in D. Pepler and K. Rubin (Eds.), *The Development and Treatment of Childhood Aggression*. (Hillsdale, N.J.: Lawrence Erlbaum, 1991).