1 Introduction: A Young Science with a Long History

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> We must address the roots of violence. Only then will we transform the past century's legacy from a crushing burden into a cautionary lesson.
> Nelson Mandela[1]

1.1 From Rags to Riches: 1939–2019

The babies born in Europe and North America between 1939 and 1945 (World War II babies) did not come into the world of humans at the best of times. Their parents were living in what could then be considered the most civilized cultures ever. However, these highly civilized cultures were creating the worst carnage ever. Between 70 and 85 million humans[2,3] were killed during World War II, including 6 million Jewish people in extermination camps, through mass shootings, and in gas chambers.

The parents and grandparents of World War II babies suffered from this Second World War before they had recovered from the numerous negative impacts of World War II. They most certainly could not foresee that their World War II babies would have the exceptional good fortune of growing up, with their own children and grandchildren, in a world that would manage to maintain the longest relative peace yet achieved among the major countries involved in World War II. From that perspective, the World War II babies born in Europe and North America can probably be considered the luckiest humans who have ever lived … until the Covid-19 pandemic!

A demographic anomaly appears to be one of the most important causes of their good fortune. Indeed, the World War II babies were born

[1] Forward in Krug, E. G., Dahlberg, L. L., Mercy, J. A., Zwi, A. B., & Lozano, R. (Eds.) (2002), *World report on violence and health*. Geneva, Switzerland: World Health Organisation.
[2] Wikipedia. (n.d.-a). The Holocaust. Retrieved November 21, 2019, from https://en.wikipedia.org/wiki/The_Holocaust
[3] Wikipedia. (n.d.-b). World War II casualties. Retrieved November 21, 2019, from https://en.wikipedia.org/wiki/World_War_II_casualties

just ahead of a major increase in their countries' birth rates during the 20 years that followed the end of World War II (Jones, 1980; Owram, 1997; Statistics Canada, 2011). Labeled the 'baby boom', this demographic phenomenon is generally considered to have started immediately after the end of World War II and lasted until the mid-1960s. Being born just ahead of the baby boom, the World War II babies surfed on the crest of an exceptionally large wave of births occurring at the same time as remarkable progress in wealth, education, health care, and technology, which was labeled 'The Golden Age of Capitalism' (Schor & Marglin, 2011).

A good example of the underlying mechanism by which the World War II babies hugely benefited from the baby boom relates to the profession of the 11 authors of this book: university professor.

In the late 1960s, universities had to hire an increasing number of new faculty to provide higher education to the large wave of baby boomers who were starting to knock at their doors. For example, official statistics for the age distribution of faculty in Canadian universities show that, for the 1970 academic year, they had the largest proportion (20%) of faculty who were less than 31 years old. The babies born between 1939 and 1945 were now between 25 and 31 years old, and were being offered faculty positions at the end of their PhD studies, and even sooner.

The window of opportunity for being appointed to a faculty position at a relatively young age was short. By 1980, the proportion of faculty who were not yet 31 years old in Canada had declined to 5%, and by 1990 they had essentially disappeared.

Unprecedented opportunities for the World War II babies went much beyond getting a faculty position at a relatively young age. Because the amount of research funding for university faculty was increasing, and new research funding agencies were created, the competition to receive funding for research was probably at its lowest ever. For example, the British Economic and Social Research Council was created in 1965, while its equivalent in Canada (the Social Sciences and Humanities Research Council) was created in 1977.

With an early faculty position and relatively easy funding opportunities for their research, the World War II babies also benefited from the sustained economic growth in North America and Europe that followed the end of World War II.

Economic growth was also associated with growth in technology. The World War II babies benefited from the fastest growth in technology the planet had ever seen. For example, during his early childhood (1944–1950), the author of this introduction had an uncle who was a 'milkman' and delivered milk bottles with a horse-drawn carriage to his parents' house, only 1 km from the center of Canada's capital. Less than 10 years

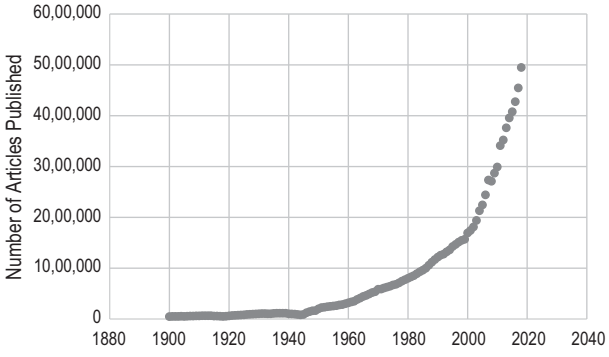

Figure 1 Number of scientific articles published between 1900 and 2018
(Compiled by Vincent Larivière, University of Montreal, September 11, 2019)

later, astronauts were circling the globe in spacecraft, and it took only 10 more years for astronauts to walk and drive on the moon!

The globalization of trade, space research, and holidays was also accompanied by the globalization of human development research. The World War II babies from Europe and North America who studied human development were the first to easily visit each other regularly, meet at international conferences, write research proposals and scientific papers together, get funding from different countries, and exchange students from all over the planet.

The acceleration of scientific productivity can be seen in Figure 1.1, which illustrates the number of scientific articles published since the beginning of the 20th century. Note the substantial increase in the number of scientific papers published after the 1940s, which was followed by a more extraordinary increase since the start of the second millennium. It is hard to imagine a steeper curve than the acceleration in scientific publications over the past 20 years, when the World War II babies were in their prime (Larivière, Gingras, Sugimoto, & Tsou, 2015).

1.2 Research on the Development and Prevention of Violent Behavior: 384 B.C.–A.D. 2019

To help the reader understand the scientific contributions of the World War II babies to research on the development and prevention of violent behavior, **defined as the use of physical strength that causes physical harm (physical aggression),** it is useful to briefly summarize the long history of this research area.

1.2.1 The Philosophers' Perspectives: 500 B.C.–A.D. 1762

The tendency to use physically violent behavior among humans was most probably at the center of the first human reflections on human behavior and its development. In the Bible we read that the author (Cain) of the first murder was the son of the first woman (Eve), who incited the first man (Adam) to sin.

The intellectual debate on the origins of human violent behavior also has a long history. In his book *On Politics*, Aristotle (384–322 B.C.) proposed a basic methodological step to understand the origins of any phenomenon: 'He who considers things in their first growth and origin, will observe the clearest view of them' (Aristotle, 1943, Book 1, ch. 2). The authors of the present book are among the 'modern' investigators who adopted Aristotle's advice to study the early origins of the phenomena they wished to understand. In particular, they initiated numerous longitudinal studies of children in order to understand the early development of violent behavior.

Aristotle, like others who observed the development of children from early childhood, concluded: 'anger and will and desire are implanted in a child from their very birth, but reason and understanding develop as they grow older' (Aristotle, 1943, Book 7, ch. 15, p. 405).

He added: 'It is by our actions in the face of danger and by training ourselves to fear or courage that we become either cowardly or courageous. It is much the same with our appetites and angry passions … So, the difference between one and another training in habits in our childhood is not a light matter, but important, or rather, all-important' (Aristotle, 1943, *Nicomachean Ethics*, Book II, ch. 1, pp. 101, 102).

Three centuries later in Rome, Seneca (4 B.C.–A.D. 65) wrote one of the best descriptions of human anger and its relation to violent behavior:

> You have demanded of me, Novatus, that I should write how anger may be soothed, and it appears to me that you are right in feeling especial fear of this passion, which is above all others hideous and wild: for the others have some alloy of peace and quiet, but this consists wholly in action and the impulse of grief, raging with an utterly inhuman lust for arms, blood and tortures, careless of itself provided it hurts another … and greedy for revenge even when it drags the avenger to ruin. (Seneca, 1900, p. 48)

Fast forward across three more centuries and we find Saint Augustine (365–430) writing in his *Confessions* how he conceived the idea of 'original sin'. In his effort to discover when he had started to sin, he realized that he could not remember his early childhood well enough to identify at what age he had committed his first sins. He decided to observe babies and toddlers with the hypothesis that they did what he had done when he was their age. He reports in Book 1 of his *Confessions*:

Who remindeth me of the sins of my infancy? doth not each little infant, in whom I see what of myself I remember not? What then was my sin? was it then good, even for a while, to cry for what, if given, would hurt? … to do its best to strike and hurt, because commands were not obeyed … ? The weakness then of infant limbs, not its will, is its innocence. Myself have seen and known even a baby envious; it could not speak, yet it turned pale and looked bitterly on its foster-brother. Who knows not this? (Saint Augustine, A.D. 401, Book I, para. 11)

To understand one of the basic sources of misunderstanding among experts of the development of violent behavior throughout history, it is important here to reflect on Saint Augustine's point when he writes: **'**The weakness then of infant limbs, not its will, is its innocence**'.**

Saint Augustine tells us that we tend to view young children as unable to be violent (physically hurt others) because they do not have the physical strength to hurt us. When we investigate the origins of violent behavior by observing the behavior of young children, we need to ask ourselves, if this child were suddenly 6 feet tall and continued to behave in the way he is presently behaving, would we label the behavior violent?

The Greek and Roman philosophers' tradition of observing early childhood development in order to understand human development was continued by Erasmus of Rotterdam in his 1529 book *On Education*. Following Saint-Augustine's insight, he writes:

We should be especially careful with our children during their first years. For at this stage their behavior is guided by instinct more than by reason, so that they are inclined equally to good and evil – more to the latter perhaps – and it is always easier to forget good habits than to unlearn bad ones.

This truth was already known to pagan philosophers and caused them great perplexity, but their speculations were unable to penetrate **the real cause**, and it was left to Christian theology to teach the truth that since Adam, the first man of the human race, **a disposition to evil** has been deeply ingrained in us.

While this is indisputably man's condition, however, we cannot deny that the greater portion of this evil stems from corrupting relationships and misguided education, especially as they affect our early and most impressionable years. (Erasmus, 1985, p. 321)

We can see that Erasmus was following a 2,000-year-old philosophical tradition, beginning with Aristotle, of associating humans' aggressive behavior with 'biological' inheritance (labeled 'original sin' by Saint Augustine). However, Erasmus also highlights the 'greater' effects of the environment during early childhood development.

A century later, a British philosopher who fled to France (1640–1651) during the English Civil War, Thomas Hobbes, modernized the same basic idea in his classic book *On the Citizen*:

Unless you give infants everything they want, they cry and get angry, they even beat their own parents … Thus an evil man is rather like a sturdy boy, or a man of

childish mind, and evil is simply want of reason at an age when it normally accrues to men by nature governed by discipline and experience of harm … It is evident therefore that all men (since all men are born infants) are born unfit for society; and very many (perhaps the majority) remain so throughout their lives, because of mental illness, or lack of training (*disciplina*) … Therefore, man is made fit for society not by nature but by training. (Hobbes, 1642/1998, p. 11)

The challenge to 2,000 years of relative agreement on the biological and environmental mechanisms leading to aggressive, violent, antisocial behavior came one hundred years after Hobbes from a citizen of the Republic of Geneva, where Calvin (1509–1564) imposed a stern reformation which outlawed entertainment, including music!

Jean-Jacques Rousseau published his classic book *Émile, or On Education* in 1762. It was immediately burned by the Geneva authorities, but the book became the new bible for an 'age of reason' that was turning to a 'romantic' perception of human behavior. The first phrase of the book is a good summary of the philosophical and social revolution Rousseau apparently intended: 'God makes all things good; man meddles with them and they become evil' (Rousseau, 1762/1957, p. 5).

This condemnation of civil societies had profound impacts on the social sciences from their 'creation' in the 19th century to the present day. For example, exactly 201 years after Rousseau, the most frequently cited psychologist at this point in time, according to Google Scholar, Albert Bandura, appears to have simply rewritten Rousseau's phrase in Emile – 'There is no original sin in the human heart; the how and why of the entrance of every vice can be traced' (p. 56) – when he wrote: 'People are not born with preformed repertoires of aggressive behaviors; they must learn them in one way or another' (1973, p. 61).

Rousseau was the first who dared to say, with elegance, what most of us like to think: Humans were happier when they lived in a paradise where they could benefit from the fruits of the earth without having to share them with others and obey social rules. Societies are corrupt, and they corrupt our children. The idea of the good savage who lives alone in harmony with nature is still a dream shared by many 'modern' humans.

1.2.2 The Beginning of the Scientific Approach: 19th Century

The use of the scientific approach to understand social behavior and society started during the 19th century. The groundbreaking research done by Adolfe Quetelet and Charles Darwin is a good illustration of the advancement of knowledge on the development of aggressive and violent behavior. Similarly, the work of British social reformer Mary Carpenter is

a good example of the systematic preventive efforts that started during the 19th century.

1.2.2.1 Adolfe Quetelet: The Introduction of Statistics to Understand Human Development Like Rousseau, Adolphe Quetelet was born in the 18th century. However, these two men lived in very different worlds. Rousseau was born at the beginning of the century (1712), while Quetelet was born only 4 years before its end (1796). We have seen that there were no important differences in the methods used by Aristotle, Saint Augustine, Erasmus, Hobbs, and Rousseau to explain human development and violent behavior. They relied on their life experiences, their logic, and what others had written based on their experience and logic.

A quantum leap was made with the work of Adolfe Quetelet. Trained in mathematics and astronomy, Quetelet relied on systematic and quantifiable observations. Born in Belgium (Ghent), he apparently was attracted to drawing and poetry during his childhood. However, he eventually studied mathematics and astronomy. One of his major contributions to astronomy was the creation of the Brussels Observatory.

Surprisingly, Quetelet was also interested in human development. In fact, the word 'interested' is an understatement. In his determination to study humans' physical, cognitive, and moral development, as well as the effectiveness of medical interventions, he made major contributions to the development of statistics.

Before his 40th birthday, he had published an extensive study of human behavior titled *On Man and the Development of his Faculties, or An Essay on Social Physics* (Quetelet, 1835). He writes, in the Preface, that the book is a summary of all his work on statistics. In the first part he summarizes the statistical facts. In the second part he outlines his theory on the average man and on the organization of the social system. The scope of his statistical studies is difficult to imagine, even in our digital world. He studied factors involved in population-wide fertility, causes of death, population growth, the role of political and religious institutions, physical growth and strength development, physiological development, intellectual development, and moral development, including criminal behavior.

The physical growth studies he did were based on physical measures that had been made on soldiers to provide them with well-fitting clothes. This study led him to create the Body Mass Index, which we still use today to assess body fat. The work he did to understand the development of moral behavior led him to identify one of the most often replicated findings in modern criminology: the age–crime curve. Using data on the

age of prisoners in France between 1826 and 1829, he measured the association between age and criminal convictions. For physical aggressions he showed that the frequency increased from 16 years of age to 25–30 years and then decreased. This observation was very frequently replicated in the 20th century (Farrington, 1986).

Quetelet's work on moral development also led him to study differences between males and females. For example, he calculated the ratio of males and females who were accused of homicide between 1826 and 1829 in France. He found that there were 947 men and 111 women, a ratio of 11.72 women per 100 men (Quetelet, 1831). If we compare this ratio to the female–male ratio for homicides in the United States in 2018, we observe a similar, but magnified, difference: 7.14 (10,306 men and 1,443 women) (Statista, 2019).

It has been suggested that this female–male difference concerning the use of physical aggression is due to women's weaker physical strength, rather than their superior morality (Archer, 2009). However, Quetelet's interpretation was somewhat more nuanced. He concluded that, besides physical strength, there were two other differences between men and women that explained the sex difference in homicides. The first related to the moral domain: Women have a stronger tendency to feel shame and modesty. The second, sex difference, was related to opportunities to commit crimes: Women are more dependent and more 'home-based'.

The recent scientific debate on female–male differences in aggression opposed two different theoretical perspectives, which, to a certain extent, relate to Quetelet's explanations 200 years ago. The first, a Darwinian perspective, concludes that female–male differences originate from an evolutionary selection of females for qualities related to investment in their offspring, while males were selected for their ability to physically compete with other males (Archer, 2009). The second perspective on female–male differences in aggression focuses on females' and males' social roles. It is suggested that these differences are based on the way children are socialized by their parents and their social environment. Girls are socialized to stay at home and care for children, while boys are socialized to work in the community, where there are more risks of conflict (Eagly & Steffen, 1986). Thus, the debate is not on female–male differences in social roles but on the determinants of these social roles: children learning from their environment to behave according to their sex (Eagly & Steffen, 1986) versus genetic mechanisms accumulated during evolution which determine neurobiological differences that are reinforced by social learning in the family and the wider environment (Archer, 2009).

1.2.2.2 Charles Darwin: Human Development and Evolution of Life on Earth Charles Darwin was born 13 years after Quetelet (1809). In his autobiography, Darwin writes that his physician father wanted him and his older brother to become physicians as well (Darwin, 1876/1983). After two years of medicine at Edinburgh University, Darwin decided that he would not be a physician. However, he followed another of his father's admonitions and went to Cambridge University to become a clergyman. He established a strong relationship with the Reverend John Stevens Henslow, a professor of botany and mineralogy, whom his brother had described as 'a man who knew every branch of science' (Darwin, 1876/1983, p. 36). Through Henslow, Darwin was offered the chance to be a 'naturalist' without pay on a ship that would sail around the world for 5 years. He accepted, against the advice of his father, and went on to collect all the geological information he could in order to understand the history of our planet, while also collecting all the varieties of plants and animals he could in order to study the origins of differences among animals. This huge investment led him to the idea of the evolution of life on earth (Darwin, 1859).

The scope of Darwin's interests can be seen by comparing his book on the role of worms in agriculture (Darwin, 1881) with his book on the expression of emotions in animals and humans (Darwin, 1872). Darwin compared the development of basic emotions in animals and humans as a means of understanding the evolution of human behavior from animal behavior.

With this evolutionary perspective in mind, Darwin described his first child's emotional behavior from birth onward.[4] He specifically noted his son's angry reactions and aggressive behavior. For example, Darwin wrote:

> from his eighth day and for some time afterwards, I often observed that the first sign of a screaming-fit, when it could be observed coming on gradually, was a little frown, owing to the contraction of the corrugators of the brows; the capillaries of the naked head and face becoming at the same time reddened with blood. As soon as the screaming-fit actually began, all the muscles round the eyes were strongly contracted, and the mouth widely opened … ; so that at this early period the features assumed the same form as at a more advanced age. (pp. 151–152)

Darwin's notes describe the development of anger and aggression during early childhood (Darwin, 1888):

> Doddy at 11 months: *'During the last week has got several times in passion with his playthings, especially when the right one has not been given him. When in a passion he beats & pushes away the offending object.'*

[4] William Erasmus (Doddy) became a successful banker

> Doddy at 13 months: *'Has for some time often gone into passions for smallest offences – for instance with Anne the nurse for trying to take piece of cake from his lips with her fingers, when he wished her to take it with her mouth – out of his mouth – he tried to slap her face, went scarlet, screamed & shook his head. How has he learned that slapping gives pain – like the just-born crocodile from egg, learns to snap with its weak jaws, i.e., instinctively.'*
>
> Doddy at 27 months: *'Doddy is a great adept at throwing things & when choleric he will hurl books or sticks at Emma (mother). About a month since, he was running to give Anny a push with a little candlestick, when I called sharply to him & he wheeled around & instantly sent the candlestick whirling over my head – He then stood resolute in the middle of the room as if ready to oppose the whole world – peremptorily refused to kiss Anny, but in short time, when I said "Doddy wont throw a candlestick at Papa's head" & he said "no wont kiss Papa" – I shall be curious to observe whether our little girls take so kindly to throwing things when so very young. If they do not, I shall believe it is hereditary in male sex, in the same manner as the S. American colts naturally amble from their parents without having been trained.'*
>
> *'Doddy was generous enough to give Anny the last mouthful of his gingerbread & today he again put his last crumb on the sofa for Anny to run to & then cried in rather a vainglorious tone "Ok kind Doddy, kind Doddy"'.*
>
> *'Doddy used bit of a stick as lever to break doll.'* (pp. 418–423)

Although many 19th-century investigators of animal and human behavior explicitly stated that understanding a given behavior required the description of that behavior's development from conception onward (Cairns, 1983), not all scientists agreed. One of the fiercest debates concerning the origins of species in the 1820s, described at the time by Goethe as a volcanic eruption, was sparked by the decision of a French naturalist, Etienne Geoffroy Saint-Hilaire, to start comparing the development of animal fetuses rather than continue to compare only the anatomy of adult animals (Appel, 1987). Some 30 years later, Charles Darwin cited the work done by Saint-Hilaire and others on the differences in the development of fetuses as one of the best to support his theory of evolution (Darwin, 1859, p. 409).

1.2.2.3 Mary Carpenter: The Prevention of Delinquency through Educational Reform Mary Carpenter was born two years before Darwin (1807). Her father was a Unitarian minister and teacher who directed his own school.