

## The Changing Face of Adolescence

The lengthening of a fascinating developmental phase, its threats and challenges

By René F.W. Diekstra

### SUMMARY

*In this paper René Diekstra gives a detailed overview of adolescence today. Adolescence is a developmental phase that today considerably exceeds the length of childhood as traditionally understood (i.e. the period of birth till puberty). Remarkably, this substantial change of adolescence has at its roots not only social but also biological causes. For example, biologically, there has been a substantial decline in the age at which puberty begins. In addition, we now know that the brain reaches maturity somewhere between 21 and 25 years of age.*

*Professor Diekstra outlines some of the many threats and challenges faced by adolescents today, and discusses how we can better support and enhance adolescent development, particularly through Life Skills Education and Social and Emotional Learning programmes.*

### Introduction

*It was around noon on a bright sunny day in August that 18-year-old Jürgen Peters climbed the ladder on the outside of the water tower in the German city of Kassel. By the time he had reached the top, a number of people were already gathering at the foot of the tower, wondering and guessing what was happening.*

*It soon became clear that he intended to jump, in an attempt to take his own life. Earlier that morning, Jürgen had been fired by his boss, a local garage owner, for whom he had worked as an apprentice mechanic. The reason had been that, on being asked to test-drive a client's car, he had gone joy-riding instead and in the process had severely damaged that car as well as two others.*

*At the tower, onlookers called the police who in turn called for assistance from the fire department. A fire ladder was put up to the top of the tower, and one of the firemen tried in vain to talk Jürgen out of his plan. Then a girl he had been dating, and liked very much, was asked to talk to him. She climbed halfway up the ladder, spoke to him through a megaphone for quite some time, and succeeded in persuading him to give up his attempt.*

*While Jürgen stepped from the roof of the water tower onto the fire ladder and started his descent, a couple of youngsters about his age who had been watching the events, began to yell at him: 'Hey, you! Coward! You don't even have the guts to jump, do you?' and similar provocative remarks. Jürgen at first hesitated, and then interrupted his descent. As he lingered there, just one meter or so below the top of*

*the tower, an ominous silence descended on the scene. Suddenly, he started to move again – upwards. He hopped on the top of the tower and, almost in the same movement, jumped off.*

*During the few seconds while he fell the length of the tower, the onlookers stood in petrified silence. That silence was brutally shattered by the dull sound of the body crashing to the ground. Panicking shouts and cries of anger and distress broke loose. They heralded an extremely painful period of mourning, depression, aggression, disruption and hostility within the small community that would last several years before it began to abate somewhat.*

However sad and shocking this event must have been at the time, and today still is for those who hear or read about it, in a number of ways it is also very revealing – instructive one would almost say, if that word did not sound too cool and detached in this context. Jürgen Peters' suicide has been one of the very few cases in which the process of provoking and executing suicidal behaviour was actually 'recorded before a live audience', so to speak. It is also one of the very few cases in which the interaction between peers, 'peer pressure', is shown to be of decisive weight on the scales of life or death.

But there is much more to this tragic event than the occurrence of a tragic, provoked suicide. In a number of ways the events on that fatal day in August in Kassel are illustrative of the psychology of adolescence. Jürgen at 18 years was still an adolescent, an adult-to-become as the word adolescent literally means. His behaviour was also typically adolescent behaviour, such as his joy-riding with a customer's car, the impulsive reaction of climbing the watertower after being fired, and also the impulsive way of meeting the challenge if his peers by committing suicide. Likewise, the behaviour of these peers was typically adolescent behaviour: almost without any consideration of the risks involved they threw challenges at Jürgen as if it was merely a game.

It is difficult to imagine mature adults engaging in such dangerous, risky behaviour towards others. It is also almost unimaginable that young children would behave in the ways of Jürgen Peters and his peers. Then why is it not difficult at all to imagine adolescents doing so? What is it about adolescence that we tend first and foremost to see this as the period in life of experimentation, of risk-taking, of Sturm und Drang, of emotion-driven problem-solving? Why is it that adolescence, and in particular that period of adolescence that is called puberty, is feared by parents and other educators as the most dangerous developmental stage, a period of losing parental control to peers, of tensions and conflicts, of family chaos, of the threats of drug and alcohol abuse, traffic accidents, behavioural problems such as truancy, vandalism, risky sexual behaviour, criminality and mental problems such as depression and suicidality? Is it true, as many people claim, that such problems are particularly part-and-parcel of adolescence in the 20th and 21st centuries? In the following section we will address these questions, with particular emphasis on the issue of whether adolescence has indeed changed over the past two hundred years. While discussing this issue we will pay attention to a number of essential characteristics of

adolescent development, including brain development.

## Adolescence

It has often been said that adolescence starts in biology and ends in society. What this expression intends to convey is that adolescence starts with the gene-driven biological changes of puberty but that the end of adolescence, the point in time when a young person takes on adult status, responsibilities and independence, is first and foremost a socio-cultural given. Consequently, the length of adolescence varies from culture to culture and even from social class to social class. Throughout human history, many cultures have established a transitional period between childhood and adulthood and rites of passage that are meant to mark the emergence of the adult out of the cocoon of childhood. Consequently, adolescence as a period characterized by change and transition is not a modern phenomenon, it is not an offshoot of the industrial or post-industrial era.

What is a modern phenomenon, however, is the large number of years of life that are designated by the term adolescence in our day and age. Over roughly two centuries the developmental period called adolescence has been lengthened so substantially, that today it comprises many of the years of life that former generations and eras considered as belonging either to childhood or to adulthood. In developed countries, and increasingly so in developing countries, adolescence today comprises at least one life decade, and often even more. If one considers the fact that puberty starts between 8 and 13 years of age in girls and 9 to 14 years of age in boys (Petersen and Leffert, 1995) and that full adulthood is often not attained before the second half of the third decade of life, adolescence marks a developmental phase that today considerably exceeds the length of childhood as traditionally understood (the period of birth till puberty). Remarkably, this substantial change of adolescence has at its roots not only social but also biological causes.

### *The lengthening of adolescence: challenges and threats*

Various sources (see Tanner, 1962, Evers & Heineman, 1990) have indicated a substantial decline in the age of onset of puberty, defined as menarche (the first menstruation) or spermarche (the first ejaculation). Some authors report a drop in age of menarche from an average of slightly less than 17 years of age in the first decades of the nineteenth century to about 12.5 years by the end of the twentieth century (Evers and Heineman, 1990, Brudevoll et al., 1979, Hauspie et al., 1997).

Although precise and valid data on population level are difficult to obtain and estimates of the decline in average age of menarche and spermarche differ somewhat between authors and studies, today there is a general consensus about a substantial decline over this period. There seems to be no consensus, however, on whether the average age is still declining. Some studies report an ongoing decline (Hauspie et al., 1997), while others do not (Barsom et al., 2008).

As to the causes of the overall decline over the past two centuries, there is more speculation than valid indication. Most authors attribute the decline to better health and nutrition (see Petersen and Leffert, 1995). But how that relationship should be explained is

unclear thus far. Nevertheless, according to some authors (Hamburg, 1989) the magnitude of the decline in the age of puberty over the past two hundred years is an evolutionary novelty that poses a number of challenges and threats, to society at large, to social institutions such as schools, to families, as well as to adolescents themselves.

In order to understand the challenges and threats posed by the earlier onset of puberty and the lengthening of adolescence, some developmental facts must be considered. First is the fact that adolescence is a period of pervasive, or even dramatic, biological changes. As to outward appearance there is no other period in human life where changes are so conspicuous, both in terms of height, weight, body fat, muscle mass, hair growth, pitch of voice, and sexual characteristics. These changes are to a large extent hormonally driven.

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Second and concomitant with the biological changes are psychological changes. The adolescent experiences feelings, develops cognitions and tends towards behaviours that are both new and which require substantial adaptation, self control and identity formation. As a matter of fact, it is fair to say that the adolescent has a dual task: to learn to live in a new body while getting accustomed to the use of a new mind. This is what Jean-Jacques Rousseau had in mind when he wrote in his famous *Emile* (1762, p.198) that man is born twice: the first time for existence, the second time for life.

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Adolescence, as the second birth, is indeed a period of transformation, although it is not necessarily, as has often been claimed or assumed, a period of turmoil, 'Sturm und Drang', of intense tensions and conflicts. Only for a minority of youngsters, estimates vary between 10 to 20 % (Petersen and Leffert, 1995), can adolescence can rightfully be labelled as a 'problematic period'. Against this background, the drama of Jürgen Peters, as narrated at the beginning of this chapter, is an exception rather than the rule.

A number of aspects of the case of Jürgen Peters, however, are rather typical for the adolescent period. Most relevant are Jürgen's joy-riding, a typical example of risk-taking behaviour and experimentation, his climbing of the water tower and the implicated threat of self destruction, a typical example of impulsive emotion-focusing coping behaviour, and his reaction to the challenges by his peers, a typical example of a fragile self-identity and difficulty in resisting 'peer pressure', the temptation 'to prove oneself' to others, even if death is a probable outcome.

This raises the important question of why these phenomena are special for adolescence, or are they?' In order to answer that question, first some biological and second some psychological facts about adolescence will be discussed in more detail.

## The adolescent brain

There is more to the biological changes with which adolescence starts than the outward apparent changes in height, weight and secondary sexual characteristics. In actual fact, even before these changes that mark puberty, are beginning to appear, other remarkable but less visible changes are already going on.

For a long time it has been assumed that the human brain, like the rest of the body, reaches its mature status by the end of childhood, in or around puberty. This assumption has been reinforced by the observation that by age 5 brain size is approximately 90% of adult size. However, in the past decade a number of studies using techniques such as functional magnetic resonance imaging (fMRI) have revealed that the human brain continues to develop into the third decade of life and reaches its mature status during that time (Lenroot & Giedd, 2006, p. 720).

Important changes in or remodeling of the brain start shortly before the onset of puberty. At that time there is an increase in grey matter (neurons or brain cells) in certain brain areas, a process called neurogenesis or synaptogenesis. This increase or thickening of brain centres just before the onset of puberty seems to take place particularly in the prefrontal cortex (see Blakemore & Choudhury, 2006). This is the area of the brain that (neuro)psychologists prefer to label as 'the executive'. The basic tasks of this brain region are planning, decision making, weighing the pros and cons of different behaviours, sorting out conflicting thoughts, goal direction and exercising self control, which is the ability to suppress certain urges, that, if not suppressed, may result in asocial, antisocial or socially unacceptable behaviours.

After puberty and the following decade of life this process of the thickening of the brain cortex is followed by a process of 'thinning', an elimination of neurons or synapses ('pruning'), in which frequently used connections are strengthened and infrequently used connections are eliminated. The net result of pruning is 'fine tuning' of the brain and increased efficiency of the remaining neuronal networks. This increase in efficiency is made possible by the process of myelination, myelin being a layer that neurons build around their extension (the part with which they make contact with other neurons).

Myelin acts as an insulator and vastly increases the speed of transmission of electrical impulses from neuron to neuron (see Blakemore & Choudhury, 2006). Increased myelination leads to an increase in white brain matter in the brain. Apart from acting as an insulator, there is also reason to assume that myelin plays a protective function for neurons.

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Arriving at this point, three important conclusions can be drawn. Firstly, from a neuropsychological point of view, adolescence starts with biology, the onset of puberty, but also ends with biology, with the brain reaching its mature status roughly between 21 and 25

years of age. Secondly, during the course of adolescence the brain is not only 'under development', but it is also more vulnerable than in later years. It is for that reason that, for example, the (ab)use of alcohol and other drugs carries greater neuropsychological risks when consumed in adolescence than in adulthood. In addition, the earlier the onset of such (ab)use during adolescence, the greater the possible risks and (long term) damage.

Thirdly, thinking, planning, decision making and self control is less efficient, more difficult and more exhausting, and requires more energy from adolescents than from adults. Consequently, adolescents engage in risky, erratic, asocial, antisocial or socially inappropriate behaviour more often than adults do.

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*The (ab)use of alcohol and other drugs carries greater neuropsychological risks in adolescence compared to adulthood.*

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An intriguing question that arises is whether the declining age of puberty over the past two centuries has been accompanied by a decline in the age when the brain reaches its mature status. There is no way to answer that question empirically, since the techniques required such as fMRI were not available for most of that period. Some authors believe, however, that the number of years between the onset of puberty and brain maturity for previous generations was considerably shorter than for present generations (see e.g. Hamburg, 1989). The implication of this is that while the average onset of puberty has declined substantially, the average age of brain maturity has not changed. If that hypothesis holds up, the declining age of puberty has caused a disjunction of biological, psychological and social development. This implies that the number of years of biopsychosocial imbalance, of experiencing 'adult' feelings and desires on the one hand but not possessing an adult brain and its executive and self control functions on the other hand, have gone up dramatically. If the earlier age of puberty is indeed mainly caused by improved nutrition and health as was pointed out earlier, the bottom line might be that present-day adolescents are healthier in the physical sense, but not necessarily in terms of mental health and social or behavioural functioning.

### Adolescent threats

Indeed, recent summaries of physical health status indicators suggest an emerging trend of healthier adolescents in developed countries (Irwin & Vaughan, 1988, Diekstra, 1995). However, a more comprehensive picture of the current state of adolescent health, seems to indicate otherwise. If parameters of health include mental and psychosocial conditions and behaviours which have longer-term implications for health such as dropping out of work or school, sexual activity, substance abuse, and inclination to violence, depressive mood swings and suicidality, current data do not provide unequivocal support for the view of improving health and social well-being among adolescents.

An important explanation for this state of affairs is that the lowering of the average age of puberty has been accompanied by the earlier use of various life- or (mental) health-threatening substances as well as an earlier emergence of mental disorders (see table 1).

Table 1

- When puberty age decreases, the prevalence of disorders that are/were normally associated with adulthood increases (decreasing age of onset): such as:
  - Depression and suicidal behaviour
  - Substance abuse and dependence
  - Behavioural disorders and criminal behaviour
- Hazard model applies: the earlier a disorder appears in the life cycle the higher the risk for future episodes

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*Problem drinking and alcohol-associated morbidity and mortality rates have increased among adolescents.*

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For example, over the past fifty years increasing percentages of young people have started to drink alcoholic beverages, their alcohol consumption has increased in quantity and frequency, and the age at which drinking starts has become lower (Perry, 1989, WHO, 1989, Diekstra, 1995, Curry et al., 2004). Consequently problem drinking and alcohol-associated morbidity and mortality rates have increased among adolescents and although they are higher for boys than for girls, the rise in alcohol use appears to be as strong for girls as for boys (Perry, 1989). Chronic excessive use of alcohol among adolescents is often a reaction to social problems, such as family difficulties or failure at school, and can also aggravate these problems. Acute intoxication often removes inhibitions that would otherwise prevent risky behaviours. It is especially implicated in aggression, crime, accidents, and suicidal behaviours.

What applies to alcohol use applies, *mutatis mutandis*, to the use of other substances, such as tobacco, cannabis, cocaine, and psychopharmaca (prescribed or non-prescribed). The age of the onset of use has lowered, and the quantity and frequency of use in adolescence have generally increased. There is also growing evidence to suggest that the use of substances tends to cluster. Adolescents who are regular smokers have a higher probability of using alcohol regularly. Adolescents who drink regularly are more likely than others to use illicit drugs (WHO, 1989). Regular multiple substance use is associated with poor performance at school, at work, in sports, and with a pessimistic future perspective.

From a sociocultural perspective it is important to note that the increase in substance use among adolescents, in particular the use of alcohol, tobacco and psychopharmaca, is



associated with the increased availability of those substances both in the family and at the societal level and with the increased acceptability of their use by young people as portrayed in the media, for example.

The combination of the increased availability and acceptability of chemical mind and mood changing substances in highly industrialized countries is, from a psychological perspective, particularly relevant with regard to depression and suicidal behaviours. Depressive mood disturbances and suicidal inclination peak during adolescence. In many countries, the majority of so-called non-fatal suicide attempts (or parasuicides) in young men and women are by overdoses of prescribed and non-prescribed drugs or (other) poisonous substances, often in combination with alcohol. Once young people have taken to coping with life stresses and strains through the use of chemical substances, such as alcohol and drugs, there is a strong increase in the probability of use of other chemical substances and their (combined) abuse or over-dosage, often labeled attempted suicide in the case of a nonfatal outcome and suicide in the case of a fatal outcome.

In addition, given the vulnerability of the adolescent brain as explained earlier, substance (ab)use carries a high risk of damaging brain development with both short and long term consequences (see table 2 for possible consequences).

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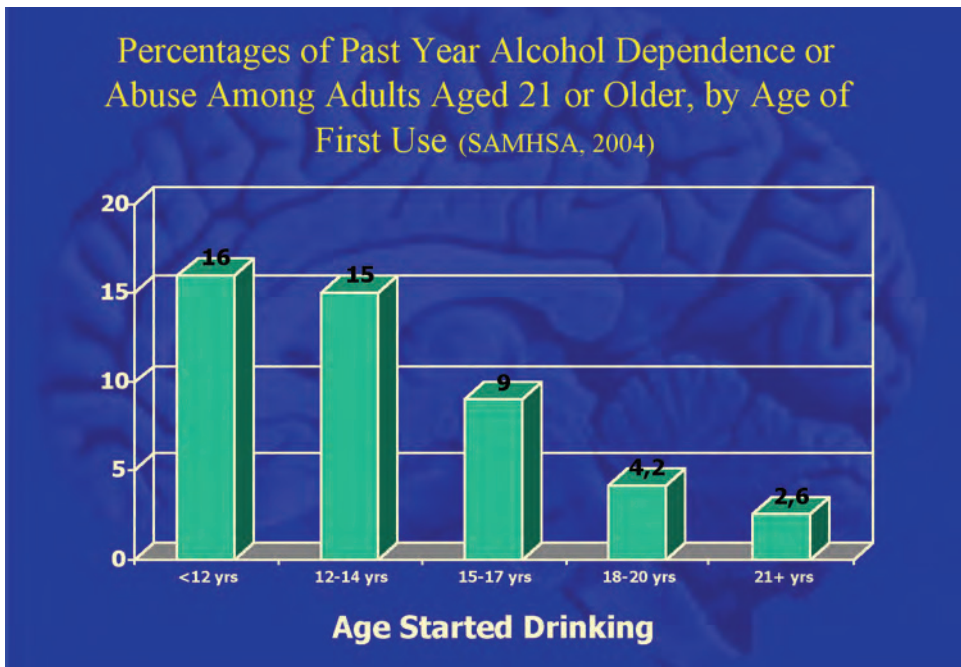
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*Table 2*

<ul style="list-style-type: none"> <li>• Adolescents with a history of extensive alcohol use or binge drinking, compared to a control group show...             <ul style="list-style-type: none"> <li>- Reduced hippocampus volume (10-35%) (part of emotional brain)</li> <li>- Less brain activity during memory tasks</li> </ul> </li> <li>• Effects of cannabis is related to hard drug use in adulthood and, in some adolescents, to irreversible brain/mental disorders (such as psychotic disorders)</li> </ul>
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It is also a given that the earlier a disorder appears in the life cycle the higher the risk of future episodes of that disorder (such as depression and substance dependence) as well as of other disorders (for example, a depressive disorder might lead to substance abuse or dependence and vice versa). Consequently, adolescent (ab)use of substances and adolescent violent and criminal behaviour as well as adolescent depression and suicidality are predictive of mental and behavioural disorders in adulthood. Figure 1 shows such a relationship for alcohol dependence and abuse, while available data convincingly show that similar relationships hold true for other disorders, such as depression and suicidal behaviour (see Merikangas & Angst, 1995, Diekstra, 1995).





Source: Substance Abuse & Mental Health Services Administration (SAMHSA). (2004)\_ National Survey on Drug Use and Health. See <http://www.oas.samhsa.gov/2k4/ageDependence/ageDependence.htm>

The clear-cut relationship between the age of an onset of a disorder or problem behaviour and the risk of future disorder episodes or problem behaviours implies a crucial indication for prevention or intervention, namely: *every year that the use of a substance or emergence of a disorder or problem behaviour is delayed, the risk of developing substance use disorders, other disorders or problem behaviours is reduced* (SAMSHA, 2004). Or stated otherwise, the earlier in adolescence that youngsters become resilient to mental ill-health and distress, the seduction of substance (ab)use and problem behaviour, the higher the probability that they will develop into healthy, mentally sound and socially well-functioning adults. To enhance the resilience of adolescents therefore constitutes a pivotal challenge.

### Adolescent challenges

An important conclusion from what has been discussed so far is that adolescence is the developmental period par excellence for fostering overall development, including physical, cognitive, social and emotional health. For adolescence is the period during which society gives the young person four important tasks to fulfill, while at the same time biology provides the opportunity to develop the brain in ways that foster and support the completion of these tasks.

The four tasks are to develop<sup>2</sup>: a) a social self or identity, being able to relate to others, both inside and outside the family of origin, in ways that are constructive, sensitive to both others' and one's own needs, conscious of rights and responsibilities; b) a sexual self, being able to experience and express a variety of feelings, build and maintain intimate

relationships with at least one member of the opposite or same sex, establishing commitment to that relationship and, possibly, to a family: c) a working self, i.e. developing a professional identity and competencies, not only to be economically independent, but also as a source of self respect, social respect, self knowledge and self actualisation: d) a philosophy of life, a moral frame of reference for making important life decisions and for understanding and evaluating the attitudes and behaviours of others.

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In order to arrive at the threshold of adulthood with considerable progress having been made in the completion of these tasks, the adolescent has a high need for input and feedback from both peers and relevant adults, not only parents but also other adults, such as teachers, employers, responsible adults in the workplace, sports clubs, volunteer organisations, spiritual or religious leaders, and so on.

A number of authors<sup>3</sup> have recently voiced the opinion that the task of such adults is to function first and foremost as the adolescent's 'frontal lobes', for learning from experience may not take place until underlying brain structures are in place. Well-informed adults look at adolescent risk taking as necessary and normal; they see one of their tasks as being to help young people to find safe ways to experiment and take risks. They also help them decipher emotions, and do not assume that they automatically achieve emotional understanding of themselves and others. They also understand that adolescents still have to learn social skills, such as communication, goal setting, problem-solving techniques, stress management, refusal skills, and decision-making skills. And they understand that successful adolescent development, including academic and professional development, depends on the extent to which the young person acquires such life skills.

The importance of the acquisition of social and emotional skills by young people has led the United Nations to include in the Convention on the Rights of the Child (CRC)<sup>4</sup> the position that: 'the education of the child shall be directed to the development of the child's personality, talents and mental and physical abilities to their fullest potential'. The implication of this article of the Convention is that the enhancement of the social and emotional development of young people is as much a task of the educational system, that is of schools, as it is a task of parents and families.

### Enhancing adolescent development

Basically there are two ways to look at the contemporary lengthening of adolescence as described earlier in this chapter. One way is to approach it as a threat because the longer the period of biopsychosocial imbalance, the higher the risk of the emergence of mental and behavioural problems and thus maldevelopment, with the potential spillover into adulthood.

The other way is to see it as both an earlier as well as a longer opportunity to help young

people to acquire the attitudes and skills necessary for healthy development and successful adulthood. Taking the latter perspective, many authors have pointed out ways to foster adolescent development and prevent the emergence or continuation of emotional and behavioural problems. Common to most propositions are the following three approaches<sup>5</sup>:

- Provide opportunities for adolescents to engage in healthy discussions that question and examine the issues of underage drinking or other high risk behaviours.
- Provide self-management skills for self-control such as refusal skills, goal-setting, and planning for the future.
- Teach decision making based on intrinsic motivation rather than external punishments or consequences.

These suggestions almost completely coincide with what many experts in the field of adolescent health and development call either Life Skills Education (LSE) or Social Emotional Learning (SEL).

In 1998 a groundbreaking meeting on Life Skills Education was held at the World Health Organisation's (WHO) Headquarters in Geneva. Participants were representatives of a number of agencies of the United Nations, such as WHO, UNICEF, UNFPA, UNHCR and UNAIDS, the joint United Nations programme on HIV/AIDS. According to the report of that meeting<sup>6</sup> there was unanimous agreement among the agencies represented that (1) life skills are of pivotal importance to the development of all youngsters around the world; (2) schools have a central role to play in the teaching of life skills; and (3) that generally Life Skills programmes, which are meant to promote healthy physical, mental and social development (cfr. WHO's definition of health as 'a complete state of physical, mental and social well-being, not merely the absence of disease') have proven to be effective in these respects.

Life Skills were defined as follows: *"abilities for adaptive and positive behaviour that enable young people to deal effectively with the demands and challenges of everyday life. In particular, life skills are a group of psychosocial competencies and interpersonal skills that help to make informed decisions, solve problems, think critically and creatively, communicate effectively, build healthy relationships, empathise with others, and cope with and manage their lives in a healthy and productive manner. Life skills may be directed toward personal actions or actions toward others, as well as toward actions to change the surrounding environment to make it conducive to health".*

The acquisition and implementation of these skills require a well-developed 'executive' in the brain, i.e. a well-developed frontal brain. This raises an intriguing question, namely: *if adults offer and deliver to adolescents opportunities for Life Skills Education or Social Emotional Learning, do they therewith enhance the maturation of the adolescent brain, the frontal parts in particular?*

The answer to that question, unfortunately, has to remain open, since at present no data

are available on the effects of so-called SFE of SFL programmes on brain development and functioning in adolescents.

However, there is a large number of studies on the effects of SFE or SEL programmes, in and outside schools, on outcomes such as increase in prosocial behaviour, self control, self efficacy, and a decrease in problem behaviour, aggressiveness, and drug(ab)use.

The most recent review of the research literature of school-based SFE/SEL programmes, comprising over 700 studies and several hundreds of thousands of adolescents, draws the following conclusions (Diekstra & Gravesteyn, 2008).

Firstly, the general picture that emerges from the research literature shows convincingly that (1) SFE/SEL programmes do indeed significantly enhance what they are teaching, namely social and emotional skills among youngsters;(2) SFE/SEL programmes significantly reduce or prevent behavioural and mental problems or disorders, such as violent, aggressive and antisocial behaviour, drug(ab)use, anxiety and depressive symptoms and disorders; (3) SFE/SEL programmes enhance or promote positive attitudes and behaviours towards self, others and school, such as self concept, prosocial behaviour, school compliance and service orientation. (4) SFE/SEL programmes significantly enhance school grades and/or academic achievement.

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Secondly, the most effective programmes appear to be those that are theoretically consistent, highly interactive, use a variety of didactic or 'work' forms, cover both general and domain-specific skills (comprehensive life skills programmes), are of considerable duration or intensity (from several months up to a year) and are cast within a supporting community or include environmental strategies. An important aspect of the latter is the use of social influence strategies, i.e. the establishment of shared norms for prosocial behaviour, interpersonal interaction, drug use (such as 'no binge drinking'), and the like.

Thirdly, teachers appear to be as effective programme deliverers as others, such as psychosocial professionals, although acquisition by teachers of skills in interactive training methods is crucial, particularly when the prevention of drug(ab)use and/or mental problems or disorders are (among) the programme goals.

Fourth, there is no reason for concern that SFE/SEL programmes are predominantly suitable for youngsters from families and neighbourhoods that are relatively well off or socially advantaged. If anything, programmes are at least as beneficial, if not more, to youngsters from socially disadvantaged family and urban contexts.

Fifth, the effects of SFE/SEL programmes appear to be larger in the short term, after programme completion and a number of months thereafter, than in the longer term, although also the longer term effects are usually significant.

The latter finding suggests something intriguing. It seems as if SFE/SFL programmes speed up the formation of the internal 'executive' and thereby shorten, so to speak, adolescence psychologically, and maybe even biologically.

If future research using present-day technology such as fMRI substantiates this supposition, a dream has become true. Adults in schools and other organizations, such as sports clubs, offering SFE/SFL education, can indeed function as frontal brains until such time that the brain of the adolescent has been developed enough to function all by itself. Against this background, it is a sad observation that in by far the majority of countries in the world, and therefore in most schools around the globe, Skills for Life Education programmes are not on offer. They are also not on offer in most youth health care facilities. Worse, most education and health care policy makers as well as the general public are not even aware of the availability and efficacy of such programmes.

### Epilogue

What if Jürgen Peters would have attended a Life Skills Education programme in high school? What if Jürgen Peters' employer would have known of the peculiarities of adolescent development, both psychologically and biologically and had acted accordingly when Jürgen returned the client's damaged car to the garage? What if Jürgen's peers at the foot of the water tower would have attended a Life Skills Education programme at high school? What if adult bystanders had been conscious of the importance of functioning as the frontal brains of those adolescent peers and had reacted accordingly and immediately? To each of these 'What if' questions applies that 'posing the question is answering it'. Clearly, there is no exaggeration in the statement that many adolescents do not develop favorably, suffer from emotional and behavioural problems that spill over into adulthood, or even, like Jürgen Peters, never make it into adulthood.. Clearly, society, parents and young people themselves suffer the loss of happiness, wellbeing and even life, mainly because of a lack of developmental knowledge, understanding and appropriate action by the adults surrounding them.

In conclusion: while adolescence has changed substantially, the changes necessary in our health and educational systems and public awareness still lag behind to an enormous degree.

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<sup>1</sup>Petersen & Leffert, 1995, who gave their publication the title 'What is special about adolescence?'

<sup>2</sup>Wall, W.F. (1968) *Adolescents in school and society*. National Foundation for Educational Research. Slough

<sup>3</sup>Partners in Life Skills Education. *Conclusions from a United Nations Inter-Agency Meeting*. Geneva: World Health Organisation. 1999, WHO/MNH/MHP/99.2, pp.14

<sup>4</sup>The CRC is a specification of the Universal Declaration of Human Rights to the particularities of the position of the child

<sup>5</sup>See N. Smith <http://www.bacchusgamma.org/>

<sup>6</sup>Partners in Life Skills Education. *Conclusions from a United Nations Inter-Agency Meeting*. Geneva: World Health Organisation. 1999, WHO/MNH/MHP/99.2, pp.14

<sup>7</sup>Partners in Life Skills Education. *Conclusions from a United Nations Inter-Agency Meeting*. Geneva: World Health Organisation. 1999, WHO/MNH/MHP/99.2, pp.14

**Rene F.W. Diekstra** is a Professor of Psychology at the Roosevelt Academy, Honors College of the University of Utrecht in Middelburg, The Netherlands. He is also a Professor of Youth and Development at the University for Professional Studies in The Hague, the Netherlands. He is a world-renowned expert on suicidal behaviour in adolescence, has worked as programme manager for the World Health Organisation in Geneva and acts as an advisor to national and local governments on youth health policies. He is the author of the first European Skills for Life programme that proved to be effective in consecutive experimental studies. Recently he carried out a nation-wide study on what grown-ups know and understand about development of children and adolescents. He has published over 45 books and over 400 articles in scientific journals. He is also a columnist for the State Journal of the Netherlands and a number of daily newspapers. Together with his partner, he guided three sons through the transition from childhood into adulthood.

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