

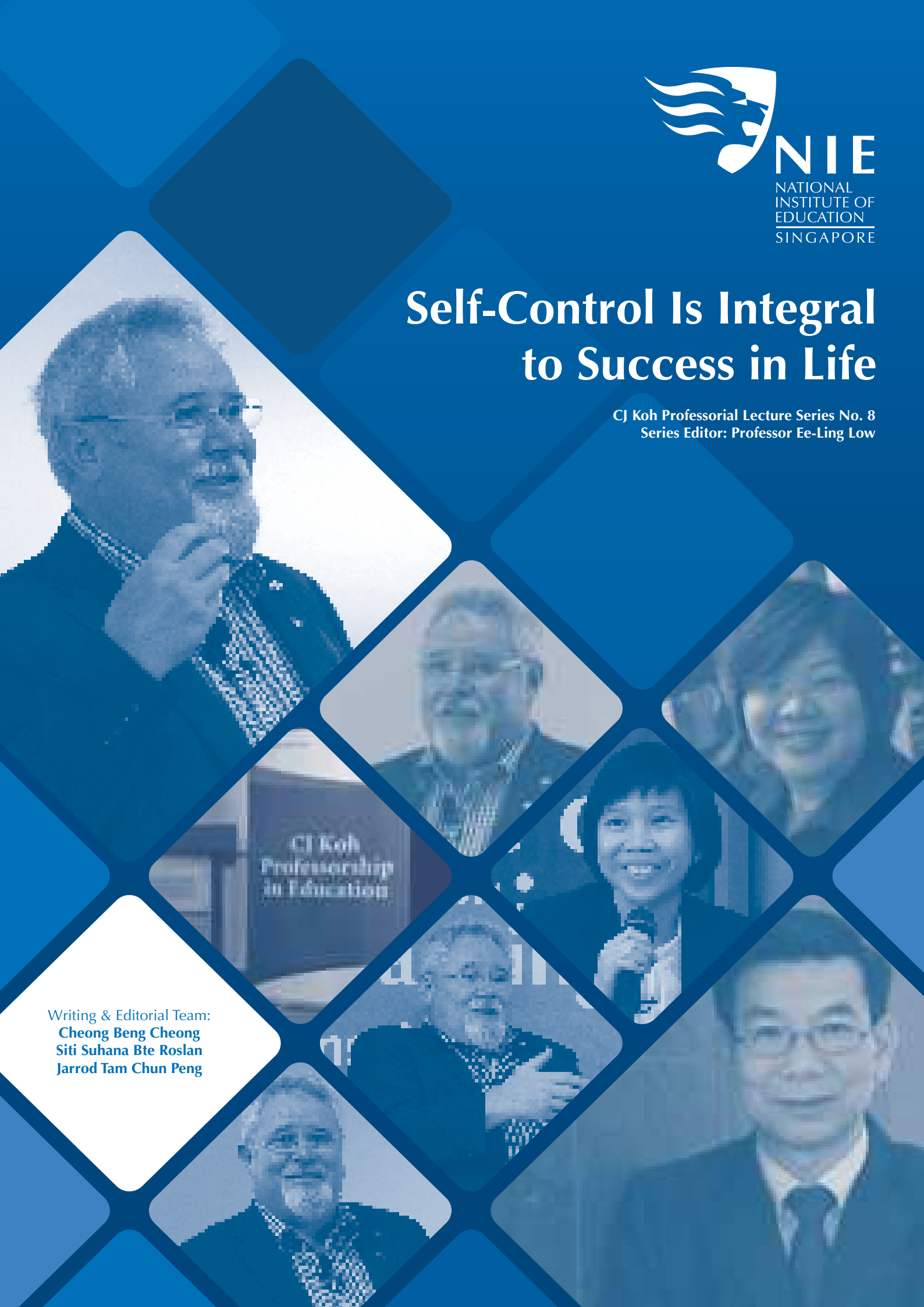


**NIE**  
NATIONAL  
INSTITUTE OF  
EDUCATION  
SINGAPORE

# Self-Control Is Integral to Success in Life

CJ Koh Professorial Lecture Series No. 8  
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**Self-Control Is Integral to Success in Life**

*CJ Koh Professorial Lecture Series No. 8*

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# FOREWORD BY NIE DIRECTOR

PROFESSOR OON-SENG TAN



**WHAT CAN PREDICT** success in life? Could it be a nurturing environment at youth, a comprehensive education, good genes or just plain hard work? These and many more questions drive both the National Institute of Education (NIE) and the Ministry of Education, Singapore (MOE) to help our children grow up into successful adults who are able live in the 21st century and beyond.

In recent years, an area that Singapore has been focusing on is Early Childhood Education. The early childhood period is seminal. What happens here is crucial down the line and we have been making heavy investments in this area. This is epitomised in Prime Minister Lee Hsien Loong's announcement of the establishment of the National Institute of Early Childhood Development (NIEC), of which NIE will play a major role

in the organisational setup and programme development. NIEC will ensure that the early childhood teachers will be academically qualified to help develop desired 21st century competencies and skills in our children.

In April 2017, NIE also established a fully dedicated research centre for child development. The Centre for Research in Child Development (CRCD) researches on four areas of early childhood development of children's competencies: executive and self-regulatory abilities, social-emotional skills, linguistic skills and mathematical skills. The Centre will ensure that more accurate and efficient measures will be seen in the development of new methodological and analytical tools. It will also focus on understanding the foundation of development, with an eye towards intervention and practices that will help children develop optimally. It will also have

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PROFESSOR OON-SENG TAN

global partnerships that will value-add to its own development.

The Centre takes its approach from how NIE has always been engaging in a multitude of good research, ranging from education to psychological and socioeconomic. NIE leaves no stone unturned. We also reach out to the world in search of wisdom that can provide new perspectives or insights. The CJ Koh Professorship in Education Endowment Fund is one such avenue and this year, we have invited renowned scientist Professor Richie Poulton.

Professor Poulton is an amazing scholar. He is the Director of the Dunedin Multidisciplinary Health and Development Research Unit. Coming not only with a psychology background and an educational aspect, he also brings the medical and social aspects into his research, thereby creating a more holistic picture. He reinforces the idea that helping a child's development is not just about the genes a child is born with or the learning that happens in school. It has a lot to do with the whole-life environment, from home to school to anywhere else.

The Unit has been conducting the longitudinal study in Dunedin, New Zealand since 1972, collecting data from 1,037 babies born then. And since its inception, the Dunedin Study still has 96% of the original participants still participating – a retention rate unheard of, especially over 40 years. Researchers have reported that participants are like-minded and geared towards the purpose of helping others, knowing full-well that this research cannot help them very much. Yet, the idea of improving the lives of others down the road drives them to keep going back to the Unit and add on to the already impressive body of data and knowledge.

The Dunedin Study is not only a good study of a population in New Zealand, but it also is considered

by many renowned scientists, academics and policymakers around the world to be an accurate study of life in any developed society, even from the most affluent to the most impoverished. It measures not just a few aspects, but a whole range. It was one of the first projects, if not the first, in 1972 to take a multi-disciplinary approach. This alone makes them groundbreaking.

This broad and in-depth collection of data has allowed them to produce over 1,500 papers from 1972 to 2016. It equates to one paper being published every 13 days over the 40 odd years. These are impactful papers that have greatly influenced policymakers, institutes and practitioners. They publish not for reputation – though they have certainly received it – but because there was so much information that they want to share with the world.

They have found predictors that range from how tall a pre-schooler would become eventually to behavioural traits that would show if a child would be successful, wealthy or healthy. For example, they found that bad behaviour also causes bad health, whether psychological, mental or physiological. The good news is that behaviour can change.

One behavioural change that was found to be a key factor for success in life is self-control, and it is a very basic principle. In Singapore, we call it self-regulation. It is an emotional attribute that can be developed from young with parents, with significant others and in school.

The Dunedin Study found that self-controlled children grew up to become successful adults. This achievement is even more powerful and forward-looking because even when this research was conducted at that time, they did not have the benefit of the advanced technologies and research of

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neuroscience. Yet, they already saw the importance of emotional links and the cognitive links from a socio-psychological perspective, and their study continues to look into these. What is key is that Professor Poulton and his colleagues were able to link how this variable affects the learner and the subsequent development through life. You will read more of it in the articles of this publication.

More importantly, as Professor Poulton himself emphasised at his lectures, is the fact that intervention is not limited to young learners. Adults are also able to cultivate more self-control. Professor Poulton's lifespan research is not deterministic in the sense that the early years determine everything, although he does say it is important that we invest in the early years. This research does not only help children but also adults. Hence, the old debate of nature versus nurture is found to be baseless. It is rather a matter of nature and nurture, genes interacting with the environment.

For Singapore, it is important to incorporate the key findings into our Early Childhood programmes. Self-control may be a basic principle, but it has a lot of impact, just like other factors, such as the environment, caregiver, parent, teacher. It helps us to take a more holistic approach to whole Early Childhood Education as we contextualise these findings from the longitudinal Dunedin Study and build on it to create something that works well for Singapore. Our own children's development and future depend on what we do now.

Professor Poulton is very knowledgeable and will be an invaluable advisor for our longitudinal studies and our efforts to help our children succeed in the future, such as the establishments of NIEC and CRCDC. He is able to bring about different perspectives, given his breadth of experience which includes links to neuroscientists, medical practitioners, social workers, family members and more.

The findings from the project are interesting and Professor Poulton's passion exemplifies its significance to life. I encourage you to read this CJ Koh publication and view a BBC-produced short series called *Predict My Life* which is based on the Dunedin Study to find out more on this stimulating topic. But I also invite you, like Professor Poulton, to build upon what the Dunedin Study has started for the sake of our future, for the sake of our children.

**Professor Oon-Seng Tan**

**Director, National Institute of Education, Singapore  
Nanyang Technological University**

**June 2018**

**Singapore**





# ABOUT THE CJ KOH PROFESSOR

RICHIE POULTON



**WORLD-RENOWNED SCIENTIST** Professor Richie Poulton is Director of the Dunedin Multidisciplinary Health and Development Research Unit, University of Otago, which conducts the longitudinal Dunedin Study.

The Study is one of the longest-running and most detailed studies of human health and development conducted in a period of over 40 years on 1,037 babies born from 1972 to 1973 in Dunedin, New Zealand. The study members have been followed up from the ages of 3 to 15 (for every 2 years), before a further follow-up

at ages 18, 21, 26, 32, 38 and 45. The Study boasts a wealth of research data that is not only broad but also in-depth. It is described by other researchers as enviable. The findings may not help the present participants of the study, but the Dunedin researchers and participants themselves hope that the data will dramatically improve the lives of those who come after them as it better informs governments on policies. This is something that Professor Poulton advocates wholeheartedly.

Professor Poulton's academic achievements are no less striking. He attained a Postgraduate Diploma in Clinical Psychology and a Master's Degree in Science from the University of Otago. He worked as a clinical psychologist before being awarded a PhD in Psychiatry from the University of New South Wales in 1995.

In the same year, he became Deputy Director of the Dunedin Multidisciplinary Health and Development Research Unit until 1 January 2000 when he became Director. In 2006, he was made Research Professor and awarded a Personal Chair by the University of Otago in the Dunedin School of Medicine. In 2007, he established and became a Co-Director of the National Centre for Lifecourse Research, a research centre based at the University of Otago with partners located at universities across New Zealand and around the world. In 2014, he was appointed as part-time Chief Science Advisor to the New Zealand Ministry of Social Development. In 2015, he became Professor in the Department of Psychology. He serves on many New Zealand government, public and academic statutory bodies, and is an international consultant.

In 2004, he was awarded the New Zealand Association of Scientists' Research Medal and the Health Research Council of New Zealand's (inaugural) Liley Medal for Excellence in Health Research. In 2005, he was awarded the University of Otago's Rowheath Trust

# ABOUT THE CJ KOH PROFESSOR

RICHIE POULTON

Award and Carl Smith Medal for Outstanding Early Career Achievement, and also received the Dunedin School of Medicine Distinguished Research Award. In 2010, he was elected as a Fellow of the Royal Society of New Zealand and was the joint recipient of the RSNZ Dame Joan Metge Medal for “excellence and building relationships in the social science research community”.

In 2014, he was awarded the Dunedin School of Medicine Dean’s Medal for Research Excellence, was named a Highly Cited Researcher by Thomson-Reuters (one of only four New Zealanders so designated) and was listed in the 2014 World’s Most Influential Scientific Minds, Thomson-Reuters. In 2016, the Dunedin Study Research Group, which he leads, received the New Zealand Prime Minister’s Science Prize for work that has had a significant impact on New Zealand and internationally. In 2017, he was appointed Companion of the New Zealand Order of Merit (CNZM) in the Queen’s Birthday Honours List in 2017.

Professor Poulton’s major areas of interest and research are mental health, nature–nurture interplay in the prediction of complex disorders, and psychosocial determinants of chronic physical disease. He has published 250+ peer-reviewed scientific papers, with many appearing in leading international journals, and he maintains numerous international research collaborations.

An astute and insightful scientist, Professor Poulton is also extremely passionate about the participants of the study. He emphasises the need to always see his participants as human beings, not just subjects in a research project. As such, the participants’ anonymity is kept in the strictest of confidence. With zeal and humour, he regularly comments that his researchers and himself would go in contempt of court if they were asked to reveal any participant information – he

reckons it quite a heroic notion. This passion for human life is why participants graciously return to undergo a series of meticulous tests, such as MRI scans, retinal scans and dental examinations, and personal interview questions. The Dunedin Study boasts a fidelity rate of 96% of original participants returning over the 40 years of research. Some now live as far away as the US and Europe.

Helping people has been the goal of the Dunedin Study and Professor Poulton, and this fidelity rate is a testament not only to the humanistic endeavour of the Dunedin Study, but also the large hearts of the researchers, of whom Professor Poulton is the leader.

# LESSONS FOR SINGAPORE FROM A LONGITUDINAL STUDY OF HEALTH AND DEVELOPMENT:

## WHAT DO THESE MEAN FOR TEACHER EDUCATION?

PROFESSOR RICHIE POULTON  
NIE LUNCH SEMINAR, NIE, SINGAPORE  
10 OCTOBER 2017



### **Abstract**

There is a particular trait that could predict an array of important life outcomes in people, and it is self-control. The Dunedin Study, which began in Dunedin, New Zealand, has been collecting data from 1,037 babies born in 1972 to 1973. They looked at a whole range of factors that impacts a child later on in adult life and identified self-control as a key factor.

In this lecture, Professor Richie Poulton spoke about the long-term impact of childhood self-control on several measures of life outcomes in adulthood. His research team found that low childhood self-control was associated with low success in adult life, such as health and wealth outcomes, higher adult conviction rates and a higher probability of having unplanned children. The team suggests interventions to be targeted at children from as early as possible. (For

more information on the Study, read “About the CJ Koh Professor” section.)

### **The Importance of Having Self-control**

Professor Poulton described self-control as the ability to regulate one’s emotions, desires and behaviours, whether they be positive or negative. Examples of self-control are: (1) thinking before speaking or acting, (2) resisting temptations and (3) refraining from saying something inappropriate or hurtful. Self-control is also the ability to control oneself in service of pursuing and achieving life goals successfully. These may include areas such as health, wealth, parenting. Most goals in life are actually difficult to attain, and there will be resistance and barriers towards achieving them.

Professor Poulton stated that although self-control has always been important and is not a recent discovery, it

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is even more important and required in the challenging 21st century environment where everything is available. For example, we live in an era when food and entertainment are more readily available.

### Taking a Multi-disciplinary Approach

In the Dunedin Study, the team utilised multiple measures in obtaining a composite picture of participants' self-control ability from researcher observations of participants in the Unit's clinic, parents' reports, teachers' reports and the child's self-reports. Participants were measured at ages 3, 5, 7, 9 and 11. When the participants reached adulthood, the team further obtained multiple measures of physical health by conducting physical assessments on participants' cardiovascular health, lung function, dental health, blood tests, photographic retina scans, among many others. In a truly multi-disciplinary fashion, social and

mental health success indicators were also measured in questionnaires where participants were said to have answered truthfully.

### Consistent Findings

As depicted in Figure 1, childhood self-control is divided into five quintiles from low to high on the X-axis. The measure of health outcomes in adulthood is on the Y-axis. From the gradient, the team found a systematic and graded relationship between childhood self-control and health outcomes in adulthood. A lot of these participants with relatively low self-control in the first decade had the worse health in adulthood. There is a decreasing relationship as the quintile of self-control goes up. This means that the more self-control one has, the better one's health is. This pattern was consistent to relationships with other measures and childhood self-control.

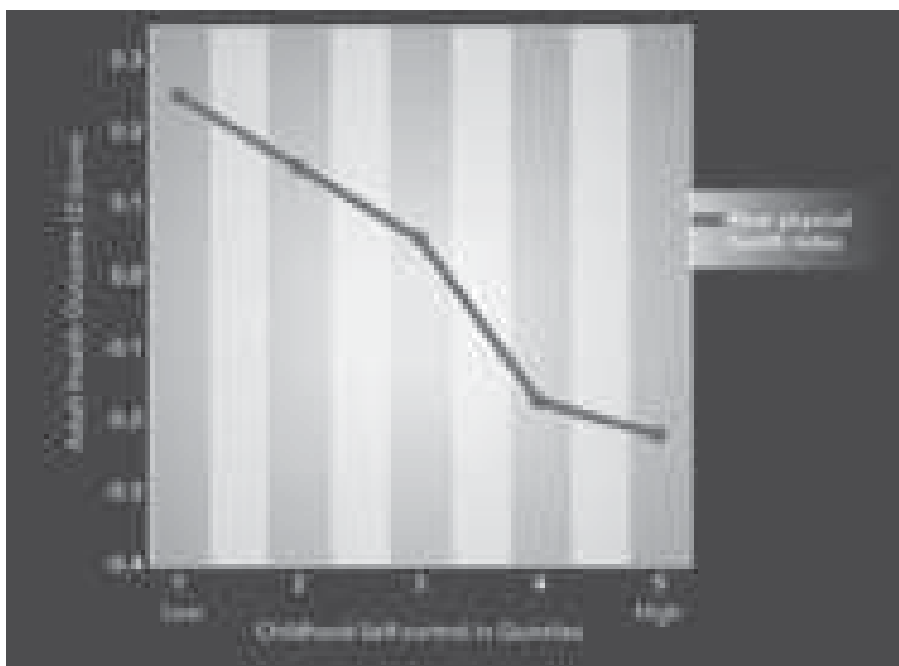


Figure 1. Participants with low childhood self-control had a poor adult health outcome.

*Permission granted by Prof Poulton.*

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Subsequently, the team looked at substance (e.g., alcohol and drug) dependence and addiction by obtaining self-reports from participant interviews and by questionnaires from significant others. Participants with low childhood self-control had more substance-dependence problems than those with high self-control.

Similarly, the higher the childhood self-control quintile, the higher the income, socioeconomic status and financial prudence achieved as adults. Participants with low childhood self-control were found to have money-management difficulties and credit problems.

In terms of the cumulative measurement of the official court conviction rate from age 17 to 32 in New Zealand, the team found that the higher the childhood self-control quintile, the lower the percentage of participants who had a criminal conviction.

Low childhood self-control participants were also found to more likely have unplanned children and were more likely to become single parents than those with high self-control. Also, in video-taped observations of parent–child interactions, participants with low childhood self-control were less warm, sensitive and stimulating when interacting with their 3-year-old child.

### **Vital Point of Intervention: Childhood**

If left without any forms of intervention, children with low self-control by age 15 were likely to end up smoking, dropping out of school and being involved in unplanned parenthood – risk factors which governments are interested in stopping or reducing. Developing this trait in the early stage of life determines much down the road.

Yet, while childhood is a very important period for human developmental, the team also found that the adolescence stage, self-control could still be cultivated. They created a “utopian” subsample of adolescents who did not smoke, dropped out of high school or had an unplanned baby, and made a comparison between this “utopian” subsample of adolescents with the full cohort of adolescents as depicted in Figure 2. In comparison to the full cohort, the “utopian” sample of adults experienced better adult health and wealth outcomes, and lower criminal conviction rates because they had a higher level of self-control at childhood. In fact, self-control can be developed at any age, though it is much harder at later stages of life.

### **Benefits to Society**

While self-control is advantageous to the individual, Professor Poulton also highlighted the benefits it has to society. Enhancing self-control was found to reduce the costs of crime control, healthcare and social welfare while promoting healthy and financially secure individuals.

Childhood self-control is also associated with the duration of welfare-benefit use in adulthood. Obtaining records from the New Zealand Ministry of Social Development, the team found that adults with low childhood self-control were on welfare-benefit for a longer period in adulthood. In New Zealand, some of the most productive years of adults is estimated to be between 21 and 32. During this period, adults with low self-control, however, spent 50 months or 4.5 years (40% of their time) being dependent on the state.

Whether it be social welfare, crime control or healthcare, the cost to the society is exorbitant. There

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are also concerns that people dependent on the state are not reaching their full potential and capability by achieving educationally or working. Childhood self-control has further benefits, increasing the life chances of the next generation to succeed as they are taught self-control when they are children.

### Contextualising Findings to Singapore

Professor Poulton emphasised that there is no “magic bullet”. Yet, having self-control is a major benefit. While critics speculate that children with much higher self-control are seen to be more “uptight” and constrained, they ignore the happiness achieved by adults who enjoy better health, more wealth, greater independence on state-welfare and the social stigma that derives from it, and not being involved in criminal activities or unplanned parenthood, just to name a few.

Therefore, resource-wise, Professor Poulton advocated that it would be good to start early as this would achieve the best benefit-cost ratio. The teaching of self-control should begin as early as possible. Teaching a child self-control skills at, for example, ages 3, 7, 11 and 15 will involve different teaching methods that are age appropriate. Moreover, it is also important for the child to maintain the ability learnt. Things taught must “stick”, as Professor Poulton described it.

Apart from age, the way self-control is taught should also be contextualised to the Singapore setting or even to the local school. A possible suggestion is for games and play that promote a strong self-control component to be taught to pre-schoolers. Such games can involve parents, need not feel onerous for any party (i.e., being seen as school work) and can be fun for pre-schoolers to continue to practise or “play” them even out of

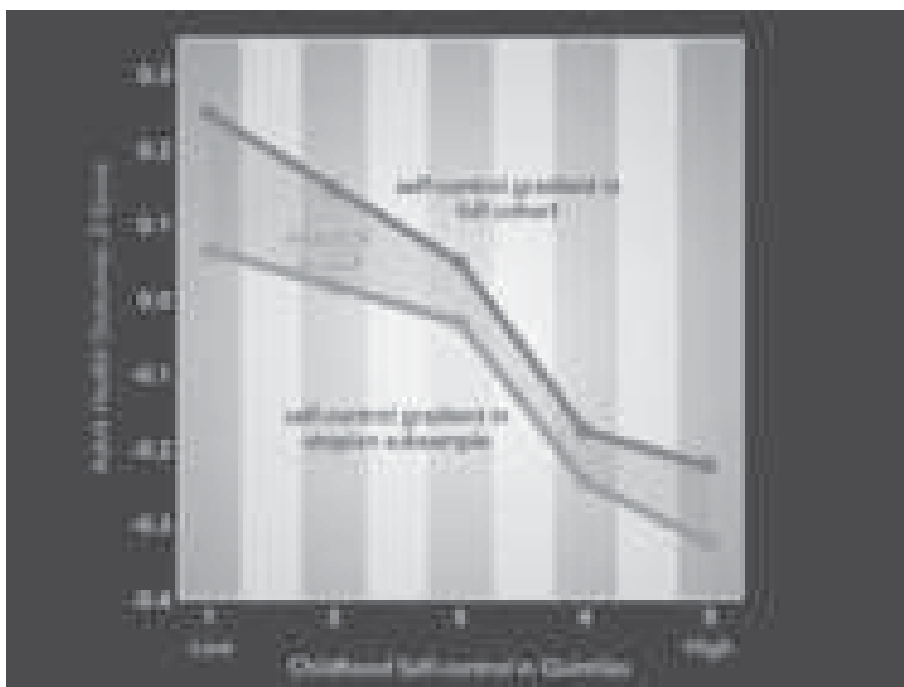


Figure 2. Comparison of number of health problems in adulthood for full cohort and “utopian” subsample. *Permission granted by Prof Poulton.*

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school. Educators can be brave and innovative to come up with clever ways to harness activities that kids love to do, implementing the activities into their classrooms and evaluating them rigorously.

Another suggestion is by turning the face-to-face activities into the fun games and placing them on the e-based platform. Because of the high sophistication of e-based programs today, e-based platform could be a good avenue to provide training for young children to develop the self-control ability. Additionally, e-based platforms are able to engage more children with less need for manpower.

Lastly, it is also crucial to engage educators to partake in the education of self-control. A possible way is by promoting to educators that self-control does matter and that it has long-term benefits.

### Conclusion

These are just suggestions that Professor Poulton has thought of or has interest in. He advocates that local educators take international findings and products and contextualise them for the Singapore setting. It is about innovating and refining, and about focusing on the children and their future.

### Q&A

**Audience member:** It seems that low self-control is negative but does your data show it can be positive in terms of taking risks in business, such as entrepreneurship?

**Professor Poulton:** The first point is that self-control is different from risk-taking. They are two different traits, related but different. Risk-taking is a different

“beast” as a personality trait. This trait does have many positive attributes that come with it when we see it in a far more balanced picture. So, I do take your point that entrepreneurship is a valued thing, but, of course, only when it succeeds. Looking at our data, maybe risk-taking is an entry point to high-risk sports, but once you are in the sport, self-control becomes incredibly important. You need self-control to focus on the practice and the feedback, and interact with the feedback to keep on developing that set of skills to head towards a particular mark, be it competing in the Olympics or other goals. As I am the Science Advisor to New Zealand’s high performance group, I know they are trying to use self-control as a point of difference because in games today, it is only a thousand of a second difference between winning.

**Audience member:** What factors can make the change or help individuals gain higher self-control?

**Professor Poulton:** Self-control is malleable. It can be changed. If you think of temperamental traits, self-control is a temperamental trait. It is a part of our personality, whether in children or adults. Among adults, we used the workplace as the vehicle to shed light on this potential for change. If you have certain personality tendencies and if you have a workplace environment that is conducive to the makeup of those tendencies, you will get a deepening or strengthening of tendencies that are positive and a degradation of those that are not positive. The negative part is called neuroticism or negative emotionality, that is, being quick to fly off the handle, angry, aggressive, stress reactivity, which tend to cause more problems. But they diminish if the workplace environment is conducive to the positive traits (i.e., social agency, positivity and



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collaboration) which are strengthened through time. So, if you set up the right environment, either through the purpose for self-activity or guided by some system-wide thinking, the environment will likely push you to change in a positive direction.

The golden rule is that it is harder with time. This I think is going to become clearer to the world as we all get older. I have just turned 55 and when I was younger, I used to think that age was ancient. Of course, now I am 55 and I just feel like a spring chicken. When I'm 65 or 70, I will not be saying, "I'll just sit down here and wait to die." I'll be saying, "How can I train in something new? We got to learn new stuff." And there will be a whole bunch of people sitting alongside me saying the same thing. Well, that is the 21st century challenge in terms of population – ageing is coming for all of us.



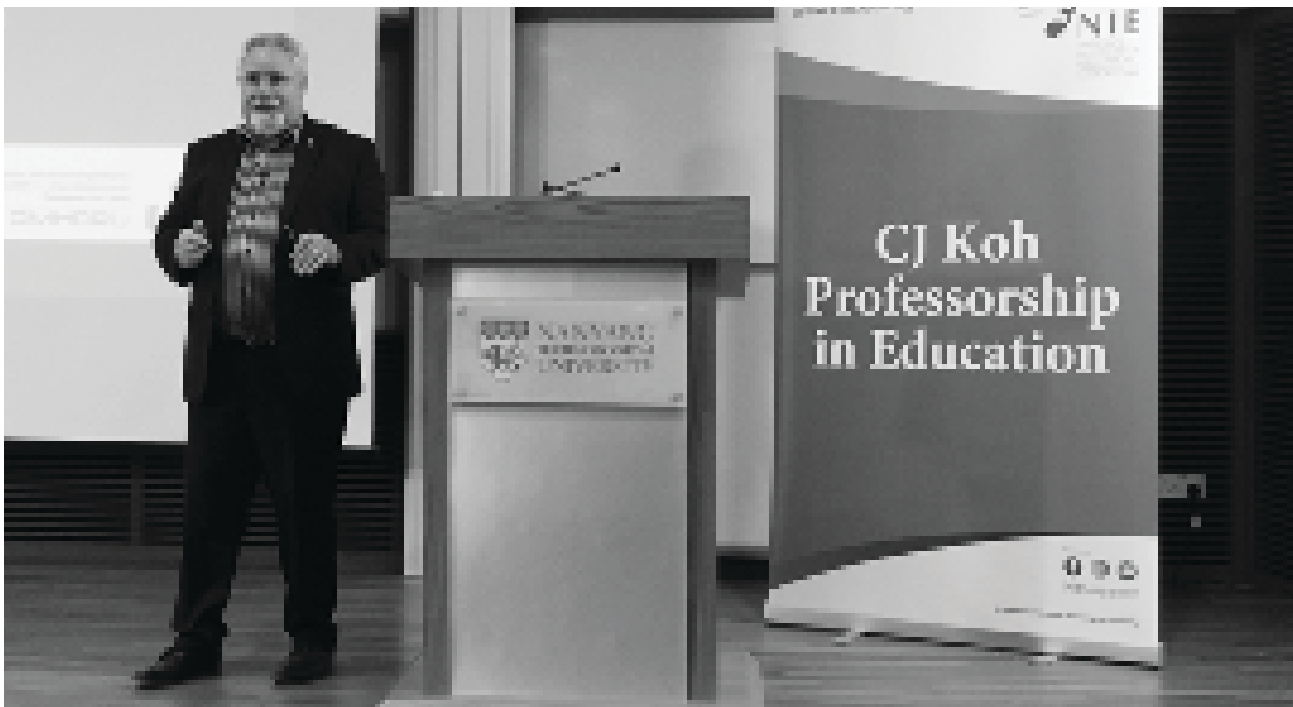
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PROFESSOR RICHIE POULTON

PUBLIC LECTURE, NTU@ONE-NORTH, SINGAPORE

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### Abstract

**PROFESSOR RICHIE POULTON** believes that the role of developmental science, in particular, neuroscience, has advanced rapidly in the last 10 to 20 years and it seems to be going in parallel with educational theory and practice. As such, he strongly suggests that these two streams merge, thus creating an interpretive process which the two can learn and inform each other. Out of the Dunedin Study comes a greater understanding on how self-control is integral to success in life, and starting to teach this 21st century skill as early as possible can significantly impact a person's life.

Professor Poulton's presentation at the CJ Koh Professorial Public Lecture got the audience to

think of the possible influence or guidance that a developmental science project, such as the Dunedin Study, can bring to educational policy and practice in Singapore. He encouraged audience members to think about how self-control can be integrated into the Singapore education system in ways that work for Singapore. (For more information on the Study, read "About the CJ Koh Professor" section.)

### Nature–Nurture Interplay

One of his research studies on genetics revealed that a person's outcome in life is not just due to genes but also due to a key factor, environment. The genes by themselves are not important. In a person's life, there is an interaction of genes and environment, or in other words, a nature and nurture interplay. Hence,

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the old argument of nature versus nurture is no longer applicable. An example would be a child who grew up in an abusive-parent environment is likely to become a violent adult.

Having identified the environment, the question next would be when to intervene in order to make the biggest difference to the person's outcome in life? Professor Poulton always goes back to education as an example of such environment, which has an enormous power to influence human beings' life trajectories, and the earlier the intervention, the better.

### **Childhood Self-control Measure**

Self-control is described as the ability to regulate one's emotions, desires and behaviours in the service of later rewards. These may be commonly seen as negative emotions, such as anger or frustration. Controlling overpowering positive emotions, however, is also important when it comes to achieving one's life goal. With a multitude of "temptations" in the 21st century, as Professor Poulton describes it, self-control is probably more important in this day and age.

In the Dunedin Study, the team used a multiple-measures approach across multiple time-points to triangulate on a composite picture of each of the participants. They gathered their data from four different sources along these time points: staff observations of participants, parents' reports, teachers' reports and also the child-participants' responses to the items on self-control, when they were aged 3, 5, 7, 8, 9 and 11 years. With the information on childhood self-control, the team

discovered an interesting robust graded relationship between childhood self-control and a range of measures obtained in adulthood.

### **Consistent Effect of Self-control on Identified Measures**

Professor Poulton introduced the measures the team had studied and showed that there was not only a clear relationship between childhood self-control and the measures, but there was also a consistent gradient relationship between them, namely, the higher the self-control, the better the outcome, and vice versa.

He also stated that these measures were looked into because governments were interested in them. This was important to the Dunedin team because they wanted to do "research that matters" to society, not just of interest to the research fraternity. Some measures that were shared in the NIE Lunch Seminar conducted on 10 October 2017 included health, substance abuse, wealth, crime, parenting and dependency of social benefits welfare.

Of special interest to policymakers and teachers was the classroom measure. Information for this was obtained from a sister study called the E-Risk Study, based in the UK. Teachers teaching E-Risk 12-year-old students were asked several questions and the responses were measured against self-control.

Results still showed similar pattern whereby children with poor self-control required more teacher effort in teaching them. This means that children with low self-control tend to use up a lot more of the teachers' time,

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were a lot more stressful to handle and took a lot more from the other children in the classroom as compared to children who had higher self-control. This shows where time may be devoted to in order to help all students in a classroom.

### **Life Satisfaction**

With all the information pointing to better outcomes for those with high childhood self-control, it is not surprising that participants with high self-control were more satisfied with life as compared to those with low childhood self-control. Essentially, they were much happier in life.

Further analysis, with control factors adjusted for, was carried out and the relationship still showed a similar gradient pattern. Control factors that were included were children's family income, children's IQ, children's gender and also children with clinical problems, such as attention deficit hyperactive disorder (ADHD).

### **Conclusion: Benefits and Interventions**

The results from the study have shown that by enhancing children's self-control, there are more benefits to gain and not just a boost of an ability. Not only will it improve in the development for education, it might also reduce the costs in areas, such as crime control, healthcare and social welfare budgets. In addition, it might increase the possibility of children being healthy and financially secured adults, as well as life improvements for the next generation.

Professor Poulton recommends that interventions are best applied before children reach their adolescent

stage because consequences of self-control will start to accumulate from early childhood years. Preventing adolescent mistakes may not be enough to eliminate the gradient of life success though it can have some benefits. With early interventions, however, the returns for investments in the early years would be greater. It would be a great opportunity for Singapore to embark on teaching children the ability of self-control and more so now with Singapore's Prime Minister citing the country's great interest in the Early Childhood sector.

From an educational point of view, starting the teaching of self-control early is important. As an expert in the field of human development, Professor Poulton believes that every country needs to have a coherent education framework that goes from the beginning to tertiary.

Starting early at an appropriate age, like pre-school, provides children a systematic opportunity to develop themselves in strong self-control skills. Good self-control is a social emotional ability, especially for the 21st century. It is an ability that can be taught and strengthened through time. Like any other ability, the more one practises it, the better one gets at it.

Education is a key environment that can massively enhance the quality of brain development. And teachers, as part of the education environment, should conduct a lot of experiments and constantly evaluate their practice which would bring improvements to the lives of children. He encourages Singapore to find our own way to teach self-control rigorously and systematically.

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Professor Poulton further stressed that this has multi-generational effects. It is imperative to keep doing and trying new things, and evaluating it as the best effects, though not huge at the moment, could be strengthened through time. We can all benefit from more self-control.

### Q&A

**Audience member:** Do you think self-control has domain-specific dimensions? For example, in the financial areas, one might have more self-control? Or why does one child show more self-control in sports but not in other areas of life?

**Professor Poulton:** The self-control we measured here is a temperamental trait. Personality and temperament denote a set of behaviours, inclinations and propensities that are reasonably consistent across time and space. It does not deny the possibility that kids display whatever their capacity is in certain domains and not others. These things are not in competition. We are talking about when the basic, fundamental, underlying tendency or propensity for self-control is.

There is a layering that would happen with third- and fourth-generation research where you get a bit more nuance or subtlety around this. But the raw form of capacity or propensity is captured in the work that we have done to date. This is because, firstly, this is the data we had available at the time and, secondly, it is necessary to show that self-control really mattered beyond IQ or socioeconomic background, in terms of its importance in determining multiple outcomes.

This is where the next generation of research in this area should move towards because if you grab hold of this, you can begin to answer these questions yourself, which is not just a favour to yourselves, but to the rest of the field. And this was what I was talking about, creating a culture of innovation. It is about trying to move these small effect sizes and moving to medium and then to large. But that will take time.

**Audience member:** In your study, were the aspects of creativity and the entrepreneurial flair looked into? If so, does self-control have a positive or indirect relationship? I ask because in schools, we noticed that children who are highly compliant, they are self-controlled in many things. Are we limiting their creativity and entrepreneurial flair?

**Professor Poulton:** This issue is a subtle one and I am glad you asked about it. You have conflated self-control with compliance, and that is a fair enough link to draw. But the self-control I am talking about is not about compliance. It is about the ability to control strong emotions within yourself in service of pursuit of goals, including creative and entrepreneurial goals, and persisting in that pursuit. In other words, if you are trying to achieve something and you are falling short, you get frustrated, angry and disappointed. Those are strong emotions and they may lead people to give up and say, "It's too hard, I can't stand it anymore".

Good self-control allows you to manage those emotions and still keep going. And I think you have the raw material of creative endeavour and entrepreneurial risk-taking vested in that capacity. Entrepreneurial

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and creative people do not just do it by chance. They achieve by following their true self and their talent, and strengthening it by practice.

Self-control is not about creating a more compliant nation; it is actually the reverse. It can sound like it on the surface but it recognises individual differences. We are different. We can all be our special, different and unique selves, and maximise our potential if we have this core ability which is to not let our emotions or passion direct us but to be in control of them as we direct our capacities and focus toward a particular set of goals.

### **About the *CJ Koh Professorial Lecture Series***

*CJ Koh Professorial Lecture Series* was launched by NIE's Office of Education Research on 1 March 2011. It was conceptualised for the purpose of knowledge building and sharing with our internal, external and international stakeholders in education, who can benefit from the information shared during each CJ Koh Professorship visit. Since 2016, the Professorship and Lecture Series were moved under the purview of the NIE Global Education Innovation Initiative under the Office of the Chief Planning Officer.

### **About the CJ Koh Professorship in Education**

Each year, outstanding professors in the field of education are hosted by the National Institute of Education under the CJ Koh Professorship in Education programme. The CJ Koh Professorship has been made possible through a generous donation by the late Mr Ong Tiong Tat, executor of the late lawyer Mr Koh Choon Joo's (CJ Koh) estate, to the Nanyang Technological University Endowment Fund.

Previous visitors have included Marilyn Cochran-Smith from Boston College (in 2006), Susan Fuhrman from Teachers College, Columbia University (2009), Robin Alexander from University of Cambridge (2010), Andy Hargreaves from Lynch School of Education, Boston College (2011), Andreas Schleicher from OECD (2011), Ruth Hayhoe from University of Toronto (2012), John Seely Brown from University of Southern California (2012), Linda Darling-Hammond from Stanford University (2013), Dennis Shirley from Lynch School of Education, Boston College (2014), Fernando Reimers from Harvard Graduate School of Education (2015) and Richie Poulton from Dunedin Multidisciplinary Health and Development Research Unit (2017).

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