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ORIGINAL ARTICLE

Innovations in Life-Course Crime Research—ASC Division of Developmental and Life-Course Criminology David P. Farrington Lecture, 2018

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I am enormously grateful to the American Society of Criminology's (ASC) Division of Developmental and Life-Course Criminology for bestowing this Lifetime Achievement Award. To me, this recognition means more than any accolade I have experienced during my career, because it signals that colleagues whose opinion matters most to me, you developmental criminologists, believe my work has been useful to you. Your approval is especially satisfying because, as I explained in my lecture at ASC2018, it took many submissions, rejections, and endless revisions and resubmissions, to secure a publication home for the paper of mine that you apparently like most and have cited most often. This was my 1993 essay on the distinction between life-course persistent and adolescence-limited offending (Moffitt 1993). There is a lesson here: If a paper of yours encounters rejection, do not give up, revise and revise again. Believe in your own ideas!

At the Division's *David P. Farrington Annual Lecture* at ASC in November 2018, the audience included many early-career criminologists. I tried to convey what research was like when I began working in criminology back in the 1980s as a student, and when I first wrote down my ideas about life-course persistent and adolescence-limited offending. The notion of developmental heterogeneity in criminal offending is part of our lexicon today; it has become part of the vernacular of criminology, at least in some quarters. Why was the idea so mysterious and fascinating back then? A university actually gave me academic tenure for writing about it! As one example, the self-report method of measuring delinquency was fairly new and we were all just learning that official police data only tap the tip of the iceberg of offending behavior. As another example, the age-crime curve was fairly novel, and we were all trying to explain its

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shape. Why do so many people offend in their youth, and why cannot some of them stop offending along with everyone else as they become adults? Quantitative trajectory modeling was not yet available as a tool to help us; Daniel Nagin brought that important tool to Criminology in the 1990s. Magnetic resonance brain imaging (MRI) for studying neurological vulnerability was a decade away. Being able to work with measured genes to study gene-environment interplay was two decades away, and genome-wide methods were at least three decades away. The demographic shifts that brought the concept of "emerging adulthood" and the prolongation of adolescence years beyond high school had not been noticed yet by social scientists. Big-data methods to merge multiple nationwide administrative records for the same individual have vastly improved today, making it now possible to perform longitudinal developmental life-course research on multiple aspects of life among millions of people who represent whole nations. (I was able to merge Danish criminal court conviction records with psychiatric hospital records for 25,000 people in my PhD dissertation, but that was very unusual, and very cumbersome). In the 1980s and 1990s, use of the internet by the public was far in the future, so naturally internet crime and the influence of social media on adolescent delinquency culture were in the future too. Despite our relative lack of information and tools, in my 1993 paper, I ventured predictions about some of these phenomena, such as neurological vulnerability, gene-environment interplay, and the spill-over from a criminal lifestyle to other aspects of life. It has since become possible for criminology to study them, and I recently wrote about interesting new avenues in research on life-course persistent and adolescence-limited offending, such as the influence of internet crime (Moffitt 2018).

My own recent work has been exploring some of these new avenues. We were at last able to test the hypothesis that people whose antisocial behavior follows a life-course persistent path have brain vulnerabilities, in a project lead by University College London postdoc Christina Carlisi. In our Dunedin, New Zealand birth cohort, structural MRI scans revealed that life-course persistent antisocial participants, but not adolescence-limited participants, tended to have brains with a smaller surface area and a thinner cortex (Carlisi et al. 2020). The obvious shortcoming of this project was that we had not performed MRI scans prospectively during the participants' childhoods. However, MRI brain scanning was not possible in the 1970s, because the MRI came into practice in the late 1980s, and even then, it was not deemed a good idea to scan children unless they had a suspected brain tumor. This lack of prospective scan data means that the brain structure differences we saw in our adult participants could well be consequences of a persistent antisocial lifestyle, not a contributing cause. However, similar brain findings have been reported from contemporary studies of young children with aggressive conduct problems, suggesting at least part of the brain differences we observed may have been present in childhood.

We also were at last able to test the longstanding hypothesis that young people whose antisocial behavior follows a life-course persistent path began life with genetic vulnerabilities. In a project spearheaded by Duke University postdoc Jasmin Wertz, we studied genetic vulnerabilities known to interfere with young people's adjustment to school, which is the first institution of social control children encounter outside the family home. It so happens that the best genome-wide association study to date has pinned down genetic variants associated with educational attainment, and it is the best because of sample size: everyone who sends a saliva sample to 23andMe or Ancestry.

com reports their highest degree, allowing the search for genetic variants associated with educational success in over a million individuals. In our UK and New Zealand cohorts born 20 years and 20,000 km apart, life-course persistent antisocial participants scored lower than adolescence-limited participants on the polygenic score that had been trained to predict success in education (Wertz et al. 2018). This finding helps to explain the oft-contested heritability of crime; it may actually be that what is inherited is characteristics that lead a child to experience school as humiliating and alienating (versus a place to build self-esteem). These characteristics could be cognitive skills, or non-cognitive skills such as self-control, both of which affect the ease of adjusting and learning in school. Young people who experience school as alienating tend to truncate their education and end up with limited alternatives to crime.

We used national registers of administrative data for all working-age citizens of New Zealand and of Denmark to study how people who appear as the highest-rate users of the criminal courts also tend to be the highest-rate users of other costly government services in those countries, including social welfare benefits, hospitals, pharmaceutical prescriptions, and accidental injury insurance (Richmond-Rakerd et al. 2020). We reported that major social problems studied in different fields—the concentration of crime, the hospital revolving-door problem, and long-term welfare dependence—all seem to involve the same relatively small, and disproportionately expensive, group of people who make up a high-need segment of the population. By linking the national-level administrative data to cohort study data, we were able to discover that people in this high-need, high-cost population segment began life as young children who had to overcome hurdles out of the starting block: learning difficulties, low self-control, maltreatment, and subsequently as teenagers, poor mental health and early school leaving (Caspi et al. 2016). This study of 4 million people, led by postdoc Leah Richmond-Rakerd, is continuing, now studying how when family members get more education; this can break up the intergenerational transmission of high-need, high-cost status from parent to child.

Another focus for us has been using our UK twin cohort to compare twins who have different crime-relevant life experiences. This use of twins rules out any and all criminogenic aspects of rearing background and genetics that are shared by siblings, to bring social scientists that bit closer to causal inference (Moffitt and Beckley 2015). Comparing siblings is a favored method in economics and medical research and should be more widely used in Criminology too. This work is underway with the team of JC Barnes at the University of Cincinnati. There, PhD candidate Ryan Motz recently reported findings consistent with labelling theory. He compared twins who were processed by the justice system as juveniles, versus their co-twin who was not, and found that the twin labelled as a convicted offender by the justice system subsequently engaged in more offending (Motz et al. 2020). This finding seems counter to specific-deterrence theory. Postdoc Peter Tanksley studied twins who had more of the personal characteristics that have in past research been hypothesized to increase children's risk for becoming a victim of violence, and compared them to their co-twin who did not have the same high level of such vulnerable characteristics. He found that low self-control increased risk for poly-victimization by multiple different kinds of violence (Tanksley et al. 2020). These findings suggest risk for becoming a victim of crime can be influenced by psychological characteristics that individuals carry with them, across contexts where they might encounter would-be violent offenders.

We researchers who work on longitudinal birth cohort studies must be jacks of all trades. We must work in many different topic areas to attract a resilient diverse funding portfolio to keep the cohort study alive. Each new wave of data collection multiplies the value of a cohort study exponentially. We cohort researchers scan the horizon for new measurement technologies the study can adopt to improve knowledge about human development. Most important, we must scramble to become knowledgeable about new topic areas, in order to keep up with the members of our cohorts as they inexorably keep growing older and enter new life stages, encountering new problems. They never stand still long enough to allow us to catch our breath. The story of my work trying to keep up with birth cohorts will be told in a book appearing this autumn from Harvard University Press (*The Origins of You*, Belsky et al. 2020b). Right now I am working on questions as varied as biological aging (Belsky et al. 2020a) and mental health (Caspi et al. 2020). But criminology is still my first true love. And it is lovely to have my affection reciprocated by receiving this career award.

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