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Articoli generali

Editorial

Risk assessment in Criminology: The science behind the principle of «never too early, never too late» to assess risk and intervene

Georgia Zara | Henriette Bergstrøm | Darrick Jolliffe

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Abstract

Risk assessment permeates our daily lives, guiding the decisions we make as criminologists, psychologists, psychiatrists, researchers, practitioners, and policymakers. However, it has been heavily criticised and ambivalently received in the context of criminal justice.

This special issue focuses on discussing the importance of risk assessment as a practice that enables intervention by identifying valuable resources and opportunities to counteract crime and promote prosocial action.

David P. Farrington's research legacy has always centred on the extent to which criminal behaviour can be reliably predicted, depending on the different levels of risk posed by offenders (*risk principle*) and their criminal careers, which are intertwined with the protective factors that cushion them. The assessment of risk alone is insufficient if it is not combined with an understanding of the criminogenic needs that characterise the person's psychosocial reality and functioning (need principle). Only then can an intervention be successfully planned (*responsivity principle*). The articles in this special issue represent an international effort to highlight the science and practice of risk assessment by examining the various settings in which it is applied, using different methods and tools.

Keywords: Risk assessment, risk factors, criminogenic needs, protective factors, responsivity.

We are grateful to Professor Roberto Catanesi – Editor in Chief – of The Italian Journal of Criminology (Rassegna Italiana di Criminology) to host this special issue on risk assessment in criminology, taking up the legacy of one of the most prominent, prolific, world-wide recognised and esteemed criminologists: Professor David P. Farrington, who passed away on 5 November 2024.

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Risk assessment in Criminology: The science behind the principle of «never too early, never too late» to assess risk and intervene

Editorial

Forensic risk assessment is important, but at the same time it has been heavily criticised and ambivalently welcomed in the context of criminal justice. And yet risk assessment permeates our daily lives, guiding the decisions we reach and the choices we end up making as criminologists, psychologists, psychiatrists, researchers, practitioners, and policymakers. This incongruence may be because risk assessment has long been seen as an end rather than a means: a kind of static procedure of categorising offenders. The remnants of this prejudiced view of risk assessment explains why policymakers have long focused their attention primarily on the «true positives» rather than the «false negatives». In other words, *what people do* can attract the attention of experts and authorities more than *what they don't do*.

A full discussion of risk assessment is important because it helps to move beyond the assertion that it is a practice that restricts a person's life within the confines of their *zone of risk*. Rather, it is a practice that enables intervention by identifying worthwhile resources and opportunities to counteract crime and take prosocial action.

Risk assessment encourages observation and professional responsibility, and while actuarial risk assessment focuses on accuracy, professional structured assessment focuses on identifying individual differences to enable the best possible individualised intervention. Therefore, an integration of these methods is what professionals should be working towards. This would include: (1) ensuring the accuracy of risk assessment tools; (2) using these to inform early intervention; (3) using these to inform management decisions and to (4) promote individualised treatment; (5) using these to monitor change; and (6) communicating risk in a way that encourages governments to invest in research and intervention to prevent children from becoming tomorrow's criminals.

Professor David P. Farrington's research legacy has always focused on the extent to which criminal behaviour can be reliably predicted, depending on the different levels of risk posed by offenders (*risk principle*) and their criminal careers, which are intertwined with the protective factors that cushion them. The assessment of risk alone is an insufficient process if it is not combined with an understanding of the criminogenic needs that characterise the person's psychosocial reality and functioning (*need principle*). Only then can an intervention be successfully planned (*responsivity principle*).

From a public policy perspective, if the assessment of risk of future antisocial behaviour is not based on research evidence, it is unsound and fallacious; if it does not inform clinicians, it is impractical; if it is out of scope, it is unhelpful; if it is not tailored to the criminogenic needs of the individual, it is unethical.

This special issue addresses the science and practice of risk assessment by looking at the different settings in which it is applied, using different methods and tools.

International colleagues and friends have enthusiastically joined us to reflect together on how we can create a more respectful and liveable world by preventing children from slipping into a life of antisocial behaviour and adults from embarking a life of crime.

Each article of this special issue offers an outstanding contribution of how criminology can strengthen our comprehension of people and their world, and presents the richness of the scope of criminology as a science and as an interdisciplinary and interprofessional practice.

Professor Friedrich Lösel addresses the importance of risk assessment in criminology by analysing its concepts, but also its challenges and perspectives. The article provides a comprehensive critical analysis of individual-oriented risk assessment to illustrate the importance of linking risk assessment and interventions. Through a detailed examination of the research findings, it becomes clear that explaining the difference between risk and danger and distinguishing the different types of risk is useful in understanding how and why risk assessment and risk management need to work together.

The article by Professor Raymond Corrado and Dr Amanda Champion is dedicated to the Cracow Instrument (CI). This is a clear example of how Farrington's developmental theoretical framework played an important role in the development of such a comprehensive risk/needs intervention and case management tool. The CI was designed and developed to help identify children and young people at risk of, or currently involved in, serious and violent behaviour using indicators from five key developmental stages, which are explained technically but very clearly in the article.

As Professor David P. Farrington's commitment was «saving children from a life of crime» through scientific research, Dr. Leena K. Augimeri and Dr. Debra J. Pepler (see their article in this issue) focus on the Stop Now And Plan (SNAP®) programme, which helps children develop practical skills to stop and think before they act, promoting better decision making in difficult situations. The Early Assessment Risk List (EARL) is a structured professional assessment scheme designed to recognise risks and develop risk management strategies. For any intervention programme to be successful, it is important to take a cul-

turally responsive and safety-focused approach, to be accountable, and to ensure that scientific and professional efforts are aligned, practical, cost-effective and make a meaningful contribution to the advancement of the field.

There is no better formulation of the essential scope of criminology, than that of Dr Christopher J. Koegl: «when it comes to addressing the problem of crime, all roads lead to prevention and early intervention» (see Koegl's article in this special issue). Indeed, the international community agrees that early provision of programmes for antisocial children is the most promising and cost-effective way to prevent their later involvement in criminal activity. The EARL-20B instrument, which was originally developed to assess the risk of later criminality in children, is an important tool for predicting health and mental health outcomes, as has already been shown in the literature.

When considering social functioning and life adjustment, it is essential to look beyond the psychopathic illusion of «health invulnerability» for reasons of treatment and prevention. Dr Guy C. M. Skinner, Dr Henriette Bergstrøm, Professor Darrick Jolliffe and Professor Georgia Zara, led by their mentor Professor David P. Farrington, have investigated psychopathy and health in the prospective longitudinal Cambridge Study in Delinquent Development (CSDD) (see their article in this special issue). Psychopathy was measured using the Hare Psychopathy Checklist (screening version), and health (e.g., physical health, mental health, hospitalisation, disabling medical conditions and premature mortality) was measured using self-report and medical records. The CSDD males who were high on psychopathic scores were also those who engaged in antisocial lifestyles (e.g., heavy drinking, post-drinking fights, smoking, sexual promiscuity), which is not *per se* a sign of poor health or premature mortality, at least according to self-reports. Some interesting differences emerged when looking at the GP reports on mental health, in which some aspects of problematic mental health conditions emerged. Given the various forms of impairment that psychopathy can cause in a person's life and in society, further investigation of psychopathy in community samples is certainly needed.

The Integrated Cognitive Antisocial Potential (ICAP) theory developed by Professor David P. Farrington is now being tested to see if it can be effective in predicting criminality in women. The article by Dr Beatriz Jesus, Dr Ângela Maia, Dr Beatriz Barqueiro, Dr Tânia Gonçalves and Dr Hugo S. Gomes (in this special issue) presents some preliminary results of a study focusing on the evaluation of ICAP theory in a sample (n = 491) of female and male participants from a public school in the central region of Portugal, and a forensic sample from four juvenile detention centres. The results show that aggressive and anti-system attitudes significantly predict delinquent behaviour. While gender moderated the relationship between antisocial attitudes and nonviolent crime, it was not relevant for violent crime, suggesting that ICAP theory may need to be adapted when assessing its applicability to female offenders, but also has significant implications for juvenile crime prevention and intervention strategies.

Professor David P. Farrington has always focused on high quality, evidence-based research in criminology. By accurately assessing risk and investing in protective factors, we can, as Professor David P. Farrington puts it, prevent (or save) people from a life of crime. Professor David P. Farrington has used criminology to get to the roots of crime and as Bertrand Russell said, «the greatest challenge to any thinker is stating the problem in a way that will allow a solution».

Professor David P. Farrington continues to be with us and work with us, because everything we know it has been learnt through his mentorship and supervision.

Georgia Zara, Henriette Bergstrøm, Darrick Jolliffe
Cambridge, Derby, London, August, 2025

RASSEGNA ITALIANA DI CRIMINOLOGIA ANNO XIX N.3 2025

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Articoli generali

Risk assessment in criminology: basic issues, challenges, and perspectives

Friedrich Lösel

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Abstract

The article deals with some of the issues of criminological risk research and assessment that continue to pose a challenge. The focus is on individual-oriented risk assessment to illustrate the importance of linking risk assessment and interventions. Although some risk assessment tools have shown high predictive power in large studies, we should recognise that risk research is not an end in itself. It is about understanding the differences between *risk* and *danger*, because risk is seen as something that can be controlled and prevented by appropriate measures, whereas danger has the connotation of an uncontrollable threat. This leads to the question of risk management and the distinction between correlational risk factors, risk markers and causal factors. It should contribute to practical measures to reduce criminal developments and support evidence-based decisions in criminal justice. By adopting a comprehensive perspective that considers cumulative risk and protective factors, the links between risk assessment and intervention become essential for risk management.

Keywords: Risk assessment, risk management, intervention, prevention

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Risk assessment in criminology: basic issues, challenges, and perspectives

Introduction

It is a sad privilege and emotional duty to contribute to this thematic issue in memoriam of Professor David P. Farrington who passed away in November 2024. I will not repeat his outstanding achievements that made him a "giant in science" as I wrote in obituaries for the ESC and in a journal (Lösel, 2024, 2025). In memoriam of David, we also published an article in CBMH (Lösel et al., 2025) that contained a prospective longitudinal study on his Integrated Cognitive Antisocial Potential Theory that is presented by Jesus, Maia, Barqueira, Gocalves and Gomes in this issue Theory. Our study demonstrated the validity of the Cracow Risk/Needs Assessment Instrument that is described by Corrado and Champion in this issue. The editors of the present memoriam issue rightly selected research on risk assessment as a topic because David addressed this intensively within his extremely broad range of studies. His famous Cambridge Study in Delinquent Development (*CSDD*) of children from London he followed up into adulthood and also in the second and third generation (e.g., Farrington et al., 2023) contributed immensely to the validation of individual and social risk factors for criminal and violent behavior. This research formed the basis for his strong engagement on risk-based developmental prevention that aimed to save children from a life of crime (Farrington & Welsh, 2007). It was not only influential in Britain but became a model for research and practice in many parts of the world. Examples of early assessment are represented in this special issue by Augimeri and Pepler, Koegl, and Corrado and Champion. Another field where David dealt with risk assessment focused on personality disorders and biological risks of criminality. For example, he published on childhood predictors of adult psychopathy (e.g., Farrington & Bergstrom, 2023), a topic that is addressed in this issue by Skinner, Bergstrom, Jolliffe, Farrington and Zara. Biological risks like low resting heart rate have been repeatedly addressed by David (e.g., Portnoy & Farrington, 2015) and also with Anna Baldry from Italy who passed away much too early. Another part of David's risk-oriented research addressed long-term consequences of school bullying (Ttofi et al., 2012) and the effects of prevention programs (Ttofi & Farrington, 2011).

In this article I will not report a specific empirical study that is related to David's work. In contrast, I will address some issues of criminological risk research and assessment that (in spite of much progress) are still challenging. As other articles in this issue, I focus on individual-oriented risk assessment and not on population-oriented crime risks on the society level. I cannot go into details of risk assessment in specific fields but only mention a few examples (e.g., from developmental risk assessment or on recidivism of adult offenders). My selected topics should shed spotlight on issues that I experienced in my own research and practice in these fields. I will not discuss statistical details but refer more to the links between risk assessment and interventions. Even when there is strong predictive power of some risk assessment instruments in large studies, we should be aware that risk research is not an end in itself (Zara & Farrington, 2016). It should contribute to practical measures for reducing criminal developments and support evidence-based decisions in criminal justice. Therefore, the links between risk assessment and intervention are essential for risk-management. This was one of the key messages from David and is well represented in the contributions to this memoriam issue.

Risk factors and causation

As in medicine and other disciplines, risk factors are personal or social characteristics of an individual that predict an enhanced or high probability of a future undesirable outcome. In criminology, typical examples are later crime or violence in youth or recidivism after sentences in adulthood. More specifically, risk may also be assessed with regard to onset, persistence, or aggravation of the respective problems. Luhmann (2003) plausibly distinguished "risk" from "danger". Whereas "danger" has the connotation of an uncontrollable threat (e.g., a flash of lightning or a tsunami), "risk" is seen as something that can be controlled and prevented by taking adequate measures. In the practice of criminological risk assessment both connotations overlap when jurisdictions address "dangerous offenders" who are confined and treated in high security prisons or forensic clinics.

As mentioned, research on risk factors and risk assessment is not an end in itself but should enable effective measures to reduce the respective risks and undesirable outcomes. This leads to the question of causality. Risk factors are based on correlational data, but effective interventions need to have a causal influence. Therefore, various authors question the usefulness of risk factors in criminology. For example, P.-O. Wikström repeatedly argued against the concept of risk factors and emphasized that truly causal influences must be investigated and validated (e.g., Wikström & Kroneberg, 2022). This argumentation is important, particularly when we look on some publica-

tions of long lists of risk factors that are not derived from theory or conceptually interrelated.

However, we should not ignore basic problems. Like risk research, much research on "causes" of criminal behavior is also based on correlational designs because natural developments cannot be studied otherwise. Wikström's Situational Action Theory (SAT; Wikström & Treiber, 2024) is only one example in this field. Here, explicit theoretical hypotheses on causal propensities and situational characteristics have reduced problems of merely statistical risk-outcome-correlations. As Wikström and others mention, one may also ask about potential "causes of causes". Some neuroscientists view genetic, physiological, or anatomic characteristics as "fundamental" risks for cognitive, emotional, and social processes. However, epigenetic processes and interdependencies between biological dispositions, mental propensities, social and other developmental factors suggest that there are no linear causal relations or hierarchies. This is similar in theories like the General Aggression Model (GAM, Anderson & Bushman, 2002, 2018; see also the developmental concept of Lösel & Bender, 2006).

It must be taken into account that the empirical relations between various levels of explanation are not very strong. Most biological factors have only small to moderate relations to antisocial behavior. For example, meta-analyses on low resting heart rate (a theoretically plausible predictor of antisociality), showed a mean effect size of d = 0.20 to antisocial behavior (Portnoy & Farrington, 2015). The effect sizes for single social risk factors are in a similar range (see below). The difficulty of explicit hierarchical relations between levels of causality is not only relevant for biosocial interactions. For example, it is unclear to what extent corporal punishment in parenting is a cause of child behavior problems or a reaction of (stressed) parents to difficult child temperament. Longitudinal path analyses suggest that there are both directions of influence, but the direct parental impact seems to be stronger (Stemmler & Lösel, 2024). There are also relations between risk factors on the individual or micro level and those on the aggregate level (e.g., parenting traditions or poverty in the community). Again, the respective effect sizes are often small and make hierarchical causal hypotheses difficult. Accordingly, risk factors on different levels are often not hierarchically structured but investigated more or less independently from each other; see, for example, LaFree and Schwarzenbach (2021) on risks for extremism and terrorism or Lösel and Bender (2006) on risks for crime and violence in juveniles.

Overall, the distinction of risk factors and "real" causes in criminology is important, but bears a risk of too much polarizing. In principle, there are different aspects of causation (e.g., Bunge, 1979) and risk assessment needs a theoretically solid as well as pragmatic approach. A plausible differentiation has been proposed by Kraemer et al. (2005). These authors distinguish between merely correlational risk factors, risk markers, and causal factors. Risk markers have no direct influence on behavioral outcomes but indicate factors that may have a causal impact. For example, a low socio-economic level or poverty of a family is a risk marker for children's antisocial behavior, but does not exert a direct influence. It is associated with various risk factors and processes that may have a more proximate influence on child development (e.g., stressful home, mental health issues, and problematic parenting).

The best validation of risk factors requires sound experimental or quasi-experimental studies that show a causal influence in an intervention. Then the classical concept of causality can be applied: a) the risk factor correlates with the outcome, b) it antedates the outcome in time, and c) alternative explanations of an observed intervention effect can be ruled out. As there are numerous threats to validity in program evaluations (e.g., Cook & Campbell, 1979; Lösel, 2007) the exclusion of alternative explanations is more easily requested than achieved in practice. It is also not always possible to define exactly what factors in a multidimensional intervention are most relevant for the success or failure of a program. Therefore, beyond basic controversies about risk versus causal factors, sound criminological risk assessment should be based on a combination of theoretical hypotheses, empirical correlations, and proven effects of interventions that reduce correlational risk factors and antisocial outcomes. Examples for this approach are the central eight risk/need factors in offender treatment (Bonta & Andrews, 2023): 1) criminal history, 2) pro-criminal cognitions/attitudes, 3) antisocial personality patterns, 4) pro-criminal associates, 5) education/employment, 6) family/marital, 6) school, 7) leisure/recreation, and 8) substance abuse. These factors are specified in detail and supported by cognitive-social learning theories of criminality (Bonta & Andrews, 2023). But the mean effect sizes for these factors are not always above the "satisfactory" threshold of an Area under Curve (AUC) above 0.70 and there are differences between the first and second four factors (e.g., Grieger & Hosser, 2014).

Aggregation of risk factors

Already the comprehensive review of risk factors for juvenile violence and crime of Lipsey and Derzon (1998) showed that most single risks have only a small effect size. Of 276 variables only 13.4% had a correlation of r = 0.21-0.30, and only 1.5% were above 0.30 (Lösel, 2002). Low effect sizes of single constructs/variables are typical in criminology and other social sciences. They are also often found in LISREL models or hierarchical regressions. Basic criminological research tries to disentangle the specific contribution of a variable to an outcome, what can be sometimes artificial when there are only small univariate differences between variables that are entered first versus later in a model. Risk assessment research has to go in the opposite direction and accumulate more or less independent single factors to achieve sufficient predictive power. A comprehensive meta-analysis of Basto-Perreira and Far-

rington (2022) can guide a meaningful selection as it revealed the most powerful core risk variables in developmental criminology. Treiber and Wikström (2025) showed that an accumulation of social risk factors has less predictive power than more proximal propensities in their sample. This is plausible and indirectly endorses practice-oriented risk assessment instruments that normally contain both kinds of data (e.g., Koegl et al. (2009) on child risk assessment).

Current crime and violence risk assessment instruments are designed for different ages, seriousness, purposes, and institutional contexts. They apply Structured Professional Judgement (SPJ; Hart et al., 2017) and contain relevant factors that are based on objective data or relatively valid expert ratings. For example, the Early Assessment Risk Lists for Boys and Girls (Augimeri et al., 2021; see also Augimeri et al. in this issue) contain three subscales on family, child, and responsivity items. The Cracow Risk/Need Assessment Instrument (Corrado et al., 2002; see also Corrado and Champion in this issue) is suitable for early and later risk assessment in children. It contains items in five subcategories (Environmental, Individual, Family, Interventions, and Externalizing Behavior) and has the particular characteristic that early assessments are also included in later ones. The HCR-20-Version 3 (Douglas et al., 2013) for violence risk assessment is widely used in the criminal justice system and in forensic contexts. It contains three subcategories of items (Historical, Clinical, Risk Management). The Psychopathy Checklist Revised (PCL-R; Hare et al., 1990) differentiates between the primary and secondary factor items and suggests a further four factors/facet model. Specific subcategories are also contained in other popular risk assessment instruments.

Most of these instruments have shown significant predictive validity in empirical studies what indicates the substantial progress of SPJ-based risk assessment. The overall discriminant validity of these instruments is mainly satisfactory. For example, the meta-analysis of Singh et al. (2011) revealed mean effects sizes (AUC) of 0.78 for SVR-20, 0.75 for SORAG, 0.74 for VRAG, 0.71 for SAVRY, 0.70 for HCR-20, 0.70 for SARA, 0.70 for Static-99, 0.67 for LSR-R, and 0.66 for PCL-R. Different numbers of studies, outcome criteria, lengths of follow-up, contexts, and other factors may have played a role in these findings and more recent ones may be slightly different. In a somewhat arbitrary classification, AUCs below 0.70 are viewed as not satisfactory, between 0.70 and 0.80 as satisfactory, above 0.80 as good, and above 0.90 as exceptional. Therefore, it is a realistic (and perhaps trivial) to conclude that even the best available assessment instruments are not yet optimal. The Receiver Operating Characteristic in AUC represents an overall validity, whereas in practice there may be particular attention for specificity (false positive rate) or sensitivity (true positive rate) in decision making. In medicine there is also a discussion about potential over-estimations of AUC (White et al., 2023).

To avoid misunderstanding, the above arguments do not at all question the many sound studies on the discriminatory ability of structured risk assessment instruments. In my view, these instruments function rather well. However, we may have reached basic thresholds for the practical predictability of specific behavioral outcomes under complex societal circumstances. In addition to the general validity data there is not yet enough attention to the specific subdimensions of the instruments in the planning and implementation of differentiated interventions. For example, with regard to the PCL-R it is often noted that Factor One (interpersonal/affective) refers to the core personality whereas Factor Two to social deviance. However, both factors are strongly correlated and Factor Two is a stronger predictor of criminal and violent behavior (Lösel, 1998). This shows problems of circularity and underscores the simple diagnostic experience that the best predictor of future behavior is past behavior in the respective field. Cooke et al. (2004) have disentangled the contents of the PCL-R and developed a more Comprehensive Assessment of Psychopathic Personality (CAPP). Similar challenges for differentiated interventions arise when we look on the Historical subscale of the HCR-20 that contains static items. Differentiated interventions need to focus on dynamic (changeable) risks. Explicit relations between the results in subcategories of structured risk assessment instruments and respective interventions are more often considered in childhood and youth, but need to be addressed in all areas of criminological risk assessment and risk-based interventions. This is not a unique problem of forensic sciences and criminology. In psychiatry and other fields differential treatment is also a challenge.

In practice, gaps between the information from structured instruments and detailed intervention planning are often filled by traditional low-structured expertise or clinical override of standardized criteria. This is also the case when structured instruments are used by experts in court trials. Such expert assessments may include characteristics of the index offence, qualitative information from staff or family members, data on expectable situations after release et cetera. These data are often less systematic and validated than the data in structured instruments. To reduce well-known problems of subjective clinical versus actuarial judgment (e.g., Grove & Meehl, 1996), practice institutions have developed guidelines for such parts of case-oriented risk assessment. Properly used, these more qualitative assessments provide "flesh to the bones" of the skeleton from data of systematic instruments. Thus, low-structured clinical and forensic expertise is still important beyond large-scale quantitative prediction studies on structured assessment instruments.

Protective factors and resilience

Traditional criminological risk assessment addresses single and accumulated risk factors for the respective undesirable outcome. However, in recent decades compensating protective factors are considered as well. For example, in risk

assessment for extremism, radicalization, and terrorism some instruments explicitly include protective factors (Lösel et al., 2025; Pressman & Flockton, 2014). On other topics risk assessors also address potential positive influences of protective factors. This widening of perspectives is supported by research on resilience in developmental psychopathology, desistance from crime, strength-based approaches in offender treatment, and general concepts of positive psychology. Although protective factors as counterparts of risk factors are intuitively plausible, the respective concepts and findings are more complicated than in mere risk research. Resilience refers to phenomena such as healthy development despite a high-risk status, maintaining competence under specific stressors, or recuperating from trauma (Lösel & Bender, 2003, 2006; Rutter 2012). The processes of successful adaptation to and coping with developmental risks require individual and social resources that have protective functions. These factors may explain why individuals with similar risk profiles show different behavioral outcomes (what is in accordance with the basic developmental principles of equifinality and multifinality). Knowledge about protective factors cannot only reduce the rate of false positives in prediction, but enable more successful prevention.

Protective factors are sometimes misunderstood as simply the other 'side of the coin' of a dichotomous risk factor or the opposite pole of a quantitative risk factor. This is the case when, for example, violence in the family, poverty, poor housing conditions etcetera are counted as risk factors, but the absence of such characteristics as being protective. Obviously, there is some tautology when the same factors are counted in different ways (and thus may accumulate explained variance either on the risk versus protective side of a profile). The analysis of protective factors and processes requires more differentiated research and assessment methods. One has to investigate curvilinear relations between quantitative variables of direct protective (promotive) factors and, in particular, assess buffering effects in interaction analyses and hierarchical regressions when risk factors are present (Loeber & Farrington, 2012; Lösel & Farrington, 2012). For example, this has been shown for low intelligence that is a risk factor in developmental risk instruments, but good intelligence is also a buffering protective factor in the presence of other risks (Ttofi et al., 2016).

Accordingly, risk and protective factors may not be different variables. The same variable may function as both a risk and protective factor, depending on the context of other factors, age period, contexts, and other conditions. For example, at younger age anxiousness seems to have a protective effect against antisocial development, but in already delinquent youngsters comorbid anxiety may increase further problems (Zara & Farrington, 2009).

Of course, practical risk assessment cannot consider numerous differentiated findings of developmental research. However, structured assessment instruments should put more attention on protective factors. If this is not yet the case, assessors in practice should have a closer look at potential resources and strengths and their relation to the risk profile of an individual. This should contribute to differentiated intervention programs. For example, most accredited offending behavior programs in England and Wales (https://www.gov.uk/guidance/offending-behaviour-programmes-and-interventions) have risk- or deficit-oriented as well as strength-based contents.

Personality characteristics and principles of symmetry

Whether at young ages or on reoffending of adult offenders, criminological risk assessment partially addresses personality characteristics. This is particularly the case for psychopathy or more specifically for impulsivity and other propensities. Several years ago, there was an intensive controversy about the validity and usefulness of general personality traits. Mischel (1973), Endler and Magnusson (1976), and other authors fundamentally questioned personality traits in psychology and emphasized person-situation-interactions. Unfortunately, this discussion partially contained misconceptions (Epstein, 1977, 1979; Lösel 1980). Operationalizations of traits should not be based on single acts, but require the assessment of multiple acts. A simple example: To assume a trait of "unpunctionality" is inappropriate when a student arrives only once or twice too lately in the classroom, but may be appropriate when there is a frequent pattern of this behavior. Accordingly, based on aggregation of data, trait concepts are alive and well (Epstein, 1977, 1979). Although, to my knowledge, the psychological controversy about trait concepts was not a topic in criminology it is still relevant for risk assessment. This is because a part of criminological risk assessment refers to general traits, but often has only single acts and narrow sources of information available.

For example, low self-control/impulsivity is rightly considered as a very important risk factor for criminality. It is also the core construct in the general crime theory of Gottfredson and Hirschi (1990). In contrast, the meta-analysis of Pratt and Cullen (2000) revealed that the mean effect sizes for the relation between self-control and criminality are not strong and larger in cross-sectional studies (r = .27) than in longitudinal designs (r = .19). Furthermore, many criminological studies of self-control are based on the 24-item self-report questionnaire of Grasmick et al. (1993). This scale contains an overlap with antisocial behaviors/items as outcomes. A meta-analysis on the Grasmick Scale and behavioral measures of self-control showed that both approaches had similar correlations with delinquency (Walters, 2016), but the relation between both types of assessment was not stronger than the relations of each with the delinquent outcomes. Walters offered four interpretations: (1) Gottfredson and Hirschi's theory contains a tautology; (2) both assessment approaches measure different constructs; (3) self-control is multidimensional; and (4) self-reports of low self-control are inadequate.

I have also carried out research on self-control and partially agree with Walters, but suggest a moderate view because impulsivity is still important for practical risk assessment. However, we need to consider different aspects/dimensions of impulsivity, more behavioral instead of questionnaire measurements, and not use it as a general explanation of crime (Lösel, 2017).

Beyond the example of impulsivity, it is necessary to consider multiple information sources and the issue of symmetry in assessments. A part of suboptimal predictions stems from the typical design of many predictors and only a single or very few outcomes. Based on Brunswik's concept of symmetry, Wittmann (1988, 2012) has shown that effect sizes are substantially larger when not only single acts are included on the outcome side of the equation. This relates to the above-mentioned multiple-act-criteria of personality traits. Assessment data should be based on multiple informants and multiple contexts. For child and youth behavior problems, Achenbach has shown that the typical intercorrelations of ratings of problem behavior are small (Achenbach, 2006; Achenbach et al., 1987) when they stem from different informants and different contexts. Lösel (2002) used data from standardized assessment instruments and found that the average cross-sectional correlations between different informants were substantially lower than the longitudinal correlations of data from the same informant. There seems to be an influence of stereotyping that may also reduce the chance of positive effects in prevention programs.

Again, these considerations should not be seen as a general problem of criminological risk assessment. However, they should alert us to use multiple data from different informants and contexts as far as possible. This would help to reduce gaps between the scientific complexity and the necessary reduction of complexity in practical decision making.

Sensitive outcome criteria

In various fields of criminological risk assessment, the base rates of outcome variables are low. For example, official sexual recidivism after prison sentences strongly declined over recent decades (from about 20% to currently 5-8%). This is rather similar for treated and untreated inmates and seems to derive from various processes on the societal level (Lösel et al., 2023). The decrease is good news for the society and potential victims. On the other hand, such a "floor effect" of very low prevalence makes valid risk predictions and the proof of effective interventions difficult. Even in rather large samples very few false negative cases can have a more or less random impact on significance. Accordingly, treatment evaluations often show significant effects on general or non-sexual violent reoffending, but not on sexual recidivism (e.g., Lösel et al., 2025).

Particularly in fields with extremely low (or high) base rates the typical dichotomous outcome criterion of "yes-no" recidivism is not sensitive. Therefore, researchers and practitioners need to include other measures. Some authors recommend non-criminal indicators of family or work relations, attitudes, and mental health. However, these are only loosely related to sexual offending. The general public and policy makers are mainly interested in "hard" reoffending criteria (that are also the legally justified aims of rehabilitation in criminal law). Some potentially more sensitive criteria are a reduced frequency of reoffending, less seriousness of reoffences, and more delayed recidivism (what would probably reduce the prevalence according to the age-crime-curve). Various studies showed that these criteria are more sensitive and suggest promising treatment effects when dichotomous recidivism revealed no significant changes. For example, in a comprehensive evaluation of sexual offender treatment in German prisons we found that an index that based on the severity of reoffending (according to the penal code) showed some desirable results (Link & Lösel, 2022). We also found that not only the mean risk level of the individuals (measured by the Static-99) was related to different recidivism rates but also the social and therapeutic climate in various institutions (Lösel et al., 2023). This suggests that in addition to personal characteristics, risk assessment should consider social framing conditions that are related to difficulties in rehabilitation processes (e.g., Carl & Lösel, 2021).

Sensitive outcome assessments are not only relevant for reoffending of individuals who carried out sexual offences. For example, there are also similar challenges in risk assessment of radicalized individuals or terrorists (Lösel et al., 2025). In addition to other specific assessment problems in this field, it is difficult to carry out long-term prospective studies on large groups as they are more available on general and violent offending. The problem of sensitive criteria is also relevant in developmental risk assessment of youngsters. Here, we often have studies that predict an antisocial outcome at one time only, although there is much developmental change over time (e.g., Jennings & Reingle, 2012; Tremblay, 2000). This problem is similar in the scarcity of longer-term follow ups in developmental prevention where most evaluation studies only gather data shortly after the program (Beelmann & Lösel, 2021; Weiss et al., 2022). Against this background, studies on risks should address a range of serious outcome problems in complex and long-term follow-ups. Some examples are represented this special issue. It is also important to investigate not only one measurement point in development but developmental trajectories over time. This approach typically reveals the most serious subgroup of consistently antisocial individuals over time, but also groups with decreasing or increasing problems in development (e.g., Farrington et al., 2023; Lösel et al., 2025).

As for other above-mentioned issues, multiple outcome measurements and time points are general challenges in criminological risk assessment. I faced them in my own research and practice. Problem solutions are not easy, not at least due to limited data access and financial restraints. I only suggest to draw attention to them in daily

practice and research. Even in the risk assessments of serious offenders in court trials practice often does not get information about long-term outcomes of expert recommendations and court decisions. This does not enable sound longitudinal feedback for assessors and judges. Risk assessors in court cases should also be aware (and according to my experience often are) that conclusions based on probability data from group studies cannot fully justify decisions on individual cases (Cooke & Michie, 2010). The false positive cases who may be kept in prison over many years are a silent population.

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Articoli generali

Mentorship in action: david farrington's transformative influence on the SNAP children's mental health and crime prevention program and the early assessment risk list (EARL) for children

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Abstract

In this paper, we reflected on the decades of guidance that David Farrington provided to the Stop Now And Plan (SNAP®) program and the Early Assessment Risk List (EARL). SNAP is a trauma-informed, evidence-based, gender-sensitive early intervention program for 6- to 11-year-old children with disruptive behavior problems, such as aggression, rule-breaking, and conduct issues. The program equips children with practical skills to pause and think before acting, fostering improved decision-making in challenging situations. The EARL is a structured professional judgment assessment scheme designed to identify risks and inform risk management strategies. It guides clinical assessments and treatment planning tailored to the needs of children with disruptive behavior and their families. We discuss how David guided us in identifying the causal risk and protective factors associated with children's aggression, delineating the active ingredients of the multi-faceted SNAP intervention, and applying rigorous methods, such as randomized controlled trials, to evaluate its effectiveness. David also spearheaded benefit-cost analyses of SNAP, demonstrating its monetary value and efficacy – an essential step in establishing its impact. His unwavering dedication to advancing the field, combined with his kindness and encouragement to think boldly, has left an indelible mark on our work and the broader discipline. To improve clinical practice, we must adopt a culturally responsive and safety-focused approach, remain accountable, and ensure our efforts are practical, cost effective and contribute meaningfully to advancing the field (Augimeri, 2019). These principles underscore the transformative power of the scientist-practitioner framework in bridging research and practice to develop scalable, impactful solutions.

Keywords: Children's aggression, antisocial behavior, evidence-based interventions, risk assessment tools, program scalability, crime prevention solutions, children's mental health

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Mentorship in action: david farrington's transformative influence on the SNAP children's mental health and crime prevention program and the early assessment risk list (EARL) for children

The main challenges for the paradigm [of delinquency prevention] are to determine which risk factors are causes, to establish what are protective factors, to identify the active ingredients of multiple component interventions, to evaluate the effectiveness of area-based intervention programs, and to assess the monetary costs and benefits of interventions (Farrington, 2000, p. 1).

"Saving children from a life of crime" has been the lifelong mission of David Farrington, Leena Augimeri, and Debra Pepler. Together, we have dedicated over 140 years to examining this critical issue from diverse perspectives - criminological, developmental, relational, educational, social, familial, individual, structural, health, legal, socioeconomic, cultural, and global. David was an extraordinary scientist, researcher, teacher, mentor, colleague, and friend whose groundbreaking research has inspired countless scientists, practitioners, students, and governments to focus on "what works for children, offenders, victims, and places." His influence extends far beyond academia - shaping our personal careers as scientist-practitioners. We are profoundly grateful for his invaluable mentorship, his willingness and generously in sharing his wisdom and vision, and his unwavering commitment to improving outcomes for at-risk children and their families.

David has guided us in identifying the causal risk and protective factors associated with children's aggression, the active ingredients of the multi-faceted Stop Now And Plan (SNAP®) intervention, and in applying rigorous methods, such as randomized controlled trials (RCT), to our work in evaluating the effectiveness of SNAP. He also conducted the first benefit-cost analysis of SNAP with Christopher Koegl, assessing monetary costs and benefits of the program (Farrington & Koegl, 2015), a critical step in demonstrating its value and efficacy. All this has been instrumental in establishing SNAP as an evidence-based model program. His dedication to advancing the field, coupled with his kindness and encouragement to think boldly, has left an indelible mark on our work and the field at large. In collaboration with David and other colleagues, we also developed the Early Assessment Risk List (Augimeri et al., 2021), a pioneering tool for identifying and addressing risk factors associated with childhood antisocial behavior. Together, these efforts exemplify the power of a scientist-practitioner framework in bridging research and practice to create scalable, impactful solutions.

David's passion for tackling complex challenges related to the development and consequences of criminality, together with his ability to think both creatively and analytically were unmatched. For example, his pioneering research included the longitudinal Cambridge Study in Delinquent Development (e.g., Farrington, 2021) and two critical and timely Study Groups he co-led with Rolf Loeber, funded by the United States Office of Juvenile Justice and Delinquency Prevention (OJJDP): Serious Violent Offenders (1997) and Very Young Offenders (1999). These study groups produced two important books with invaluable insights into young children in conflict with the law: *Serious Violent Offenders* (Loeber & Farrington, 1998) and *Child Delinquents: Development, Intervention, and Service Needs* (Loeber & Farrington, 2001).

In his 1999 Presidential Address to the American Society of Criminology, David observed, "Prior to the 1990s, there was relatively little contact between scholars who were concerned with explaining crime and policymakers and practitioners who were implementing programs designed to reduce offending" (Farrington, 2000, p. 1). With the opportunity to bridge science and practice, David became interested in SNAP and our research. We met David, along with Drs. Rolf Loeber and Magda Stouthamer-Loeber, in November 1989 at the 41st American Society of Criminology (ASC) conference in Reno, Nevada. At that time, the SNAP program was in its early stages and their attendance at our presentation was both encouraging and inspiring, because it led to decades of consultation and collaboration for SNAP with all three of these exemplary scholars.

In their research on the development of criminality, David and Rolf identified a critical seven-year window between ages 7 and 14, during which children's minor behavioral issues can escalate into serious delinquent behaviors if unaddressed (Loeber, Farrington, Petechuk, & OJJDP, 2003). Recognizing SNAP's potential to intervene and alter a child's developmental trajectory during this critical period, David took a keen interest in our SNAP program and research. Over decades, he provided invaluable guidance and support, in addition to exposing us to incredible learning and sharing opportunities (e.g., invited Leena Augimeri to participate in the Study Group on Very Young Offenders) David became a SNAP champion helping us create a clear roadmap for developing and refining our comprehensive SNAP mental health and crime prevention framework and associated research. His mentorship was instrumental in enhancing the program's approach and expanding its reach. Under his guidance, SNAP evolved into an internationally recognized, evidence-based program, transforming the lives of thousands of children, families, and communities.

In a book dedicated to Farrington's work, *Raising the Bar: Transforming Knowledge to Practice for Children in Conflict with the Law* (Loeber & Welsh, 2012), Augimeri and Koegl acknowledged the profound influence that David had on both the practitioners and researchers working on SNAP:

> He inspires our thinking and continues to push us to raise the bar in regard to risk and promotive factors, self-control, intervening early in the lives of high-risk children, and methodological issues in evaluating effectiveness of crime prevention models... Over the intervening years, we have been fortunate to have had many stimulating discussions [and participate in his study groups], for example, about the importance of randomized controlled trials; how to define and measure treatment success; understanding outliers; addressing risk factors; and incorporating scientist-practitioner ideals into our work (2012, p. 204).

David's commitment and vision to bridging the gap between research and practice has been instrumental in shaping effective interventions for children in conflict with the law.

Stepping Into SNAP

> *The best developed and validated programs for child delinquents (ages 6-11) are the Stop Now And Plan (SNAP)… boys and corresponding [girls] program implemented in Toronto, Ontario Canada (Farrington, 2012, p. 269).*

SNAP is a trauma-informed, evidence-based, gender-sensitive early intervention program tailored for children aged 6 to 11 with disruptive behaviour problems, such as aggression, rule-breaking, and conduct problems. At its core, SNAP equips children with practical skills to pause and think before acting, fostering improved decision-making in the heat of the moment. By focusing on emotional regulation, self-control, problem-solving, and social competencies like peer interactions and social skills, SNAP works holistically with children, their families, schools, and communities. A key feature of SNAP is that parents/caregivers participate in parallel programming to enhance their parenting capacities and understanding of their children's developmental needs (Hrynkiw-Augimeri et al., 1993; Levene, 2010; Levene et al., 2005; Pepler et al., 2010).

The foundational work for SNAP began in 1985, led by a collaborative team of scientists and practitioners (Kenneth Goldberg, Leena Augimeri, Debra Pepler, Kathy Levene, Camille Hannays-King and Elizabeth Leggett) at Earlscourt Child and Family Centre. Based in Toronto, Canada. Earlscourt was an applied community-based, not-for-profit, children's mental health organization (now the Child Development Institute, CDI). SNAP was developed in response to changes in Canadian legislation that raised the age of criminal responsibility from 7 to 12 in 1984. At that time, the new Young Offenders Act left a critical gap in services for young children exhibiting antisocial behaviors or in conflict with the law. Under Ken Goldberg's leadership, the beginning of the SNAP program (formerly called the Under 12 Outreach Project; ORP) was implemented with the overall goal of 'keeping kids in school and out of trouble'.

From its inception, the SNAP early intervention model has exemplified the scientist-practitioner approach by integrating rigorous research and comprehensive program evaluation. This integration not only established SNAP's effectiveness and impact, but also highlighted the pivotal role of interconnected systems shaping children's development - family, school, peers, and community. By embedding these relational elements, the SNAP model ensures a holistic understanding and support of the multifaceted relational and developmental contexts that comprise the risk and protective influences on children's wellbeing.

The extensive research on SNAP consistently demonstrates reductions in aggression, conduct problems, rule-breaking, anxiety, and depression (e.g., Augimeri et al., 2018; Burke & Loeber, 2015; Pepler et al., 2010). The research also confirms that SNAP enhances prosocial behavior, problem-solving skills, and emotion regulation while alleviating parental stress tied to managing challenging child behaviors (e.g., Burke & Loeber, 2016). Notably, SNAP proves to be particularly effective for high-risk children with severe conduct problems (Smaragdi et al., 2020). Research on the outcomes of SNAP by neuropsychologists indicates improvements in the cortical underpinnings of emotion regulation (Lewis et al., 2008; Smaragdi et al., in press), as well as structural changes in executive functioning associated with improvement in impulsivity and brain gray matter volume (Kolla et al., 2022).

SNAP operates within a comprehensive three-pronged mental health and crime prevention framework (Augimeri, 2001; Augimeri et al., 2021; Augimeri et al., 2010; Koegl et al., 2008;). The SNAP referral, assessment, and intervention framework includes:

1. Community referral protocols: Streamlining access to timely mental health services for at-risk children and their families (e.g., Augimeri et al., 1999; Koegl et al., 2000).
2. Structured professional judgment risk and needs assessment: Using the Early Assessment Risk List (EARL-V3; Augimeri et al., 2021; Augimeri et al., 2021b) to evaluate risk factors across child, family, and treatment barrier domains, with guidance for interventions to address identified concerns and reduce antisocial potential.
3. Gender-specific SNAP programming: Addressing the unique needs of boys and girls with disruptive behavior problems and supporting their families (e.g., Augimeri et al., 2017; Augimeri et al., 2014)

Building a SNAP Evidence Base

The challenge is to find out what works through high quality scientific research (Welsh & Farrington, 2006)

When we met David in 1989, we were at the beginning of developing and implementing what would become the SNAP program. In 1993, we published on the development and preliminary evaluation of the program then called the Earlscourt Under 12 Outreach Project, ORP (Hrynkiw-Augimeri et al.,1993) – as noted above was renamed SNAP as a result of the children and families identifying the program as such. The foundational program was a 12-week early intervention that included multiple components: children's self-control and problem-solving skill groups, individual befriending for the children, parent training groups, school advocacy, and crisis intervention. The core aspect of the group program was teaching the children and their families how to 'Stop Now And Plan' (SNAP) – a strategy for self-control and problem-solving. Our preliminary study of program effectiveness was with 54 boys and 10 girls, aged 6 to 12 years. We found significant improvements on parent ratings of externalizing, internalizing, and total behavior problems measured immediately after, and 6- and 12-months following participation in the program (Hrynkiw-Augimeri, et al., 1993). These findings suggested that the program was a viable response for young children in contact with the police. We postulated that the multi-dimensional approach may have been critical to its success, which was consistent with David Farrington's (2000) call for multiple component interventions to prevent the development of delinquency.

In our first randomized controlled trial (RCT), Day and Augimeri (1996) studied 16 pairs of children who were matched on age, sex, and severity of delinquency at admission, and randomly assigned to either a treatment or recreational control group. Preliminary results indicated that the treatment group showed significant improvements on measures of child behavior problems, parenting attitudes, stress and self-efficacy, which were maintained over the 6- and 10- month follow-up periods. With David's encouragement, we subsequently conducted a search of criminal records ten years later to assess long-term effects of the program. This study showed that fewer SNAP treatment children (31%) had criminal records at follow-up compared to recreational controls (57%), a difference that was not statistically significant, but represents a positive trend for delinquency prevention (Augimeri et al., 2007).

With a comprehensive SNAP manual and implementation training and consultation process and dedicated CDI SNAP Scaling, Research and Development unit, other organizations were able to offer the program and evaluate its effectiveness. Researchers at SNAP affiliate sites in Ontario and the United States have reported similar decreases in rule-breaking, aggression, and conduct problems, along with increased social skills and emotion regulation in children completing the SNAP program (e.g., Lipman et al., 2008; SNAP Pittsburgh Steering Committee, 2011; Burke & Loeber, 2015).

As a result of research and program evaluation, SNAP became a gender-specific and continued care model in 1996. We began differentiating the SNAP programming for boys and girls and began evaluating the SNAP Girls program (then called the Girls Connection) through several studies (e.g., Levene et al., 2005). The first study included all girls who had participated in the specific girls' program from 1996 through to 2000. We found significant decreases in externalizing behavior and improved social skills between admission and follow-up at 6 and 12 months (Walsh et al., 2002). Girls who remained in the clinical range after completing the program had higher scores on externalizing scales and higher co-morbidity at admission, which highlights the need to address these complex presenting problems in treatment planning (Walsh et al., 2002). We subsequently conducted a RCT on the girls' program and found significant reductions in parents' ratings of the girl's aggression, rule-breaking, conduct and internalizing problems, as well as improved girls' relationship quality with parents (Pepler et al., 2010).

The largest third-party SNAP RCT involving 252 boys between 6 – 11 years of age was conducted at the University of Pittsburgh by Jeffrey Burke and Rolf Loeber (2015). They found that SNAP significantly reduced parent ratings of aggression, conduct problems, rule-breaking, and overall externalizing behavior, as well as depression and anxiety. In addition, the SNAP program was more effective for boys with higher severity of initial behavioral problems. There were significantly fewer criminal charges for the SNAP boys compared to those in standard services. Overall, SNAP significantly outperformed treatment as usual. In addition, SNAP reduced symptoms of oppositional defiant disorder (ODD) and attention deficit hyperactivity disorder (ADHD). These treatment gains were maintained one year later.

In a follow-up study, Burke and Loeber (2016) analyzed the mechanisms that led to the behavioral changes. They reported that the children who participated in SNAP improved in problem-solving skills, prosocial behavior, and emotion regulation. Their parents reported reduced parenting stress associated with difficult child behavior. These improvements through SNAP predicted improvements in aggression. In addition, improved emotion regulation skills predicted improvements in children's anxiety and depression symptoms.

Qualitative evaluations of the program have also been conducted. Lipman and colleagues (2011) interviewed 35 families in the first SNAP affiliate site. They found that parents reported improvements in parenting skills and communication with their child, as well as overall improvements in the family relations. These results demonstrated the importance of including the parenting component of SNAP.

Recent SNAP Research

The evidence base for SNAP continues to grow through ongoing research activities. In their Campbell Systematic Review on self-control and problem behaviors, Piquero, Jennings, and Farrington (2010) concluded that early intervention programs should be used to enhance self-control and reduce delinquency and problem behaviors prior to the age of ten. Self-control, emotion regulation and problem-solving are core aspects of the SNAP program; however, previous SNAP studies did not focus on this important aspect of SNAP and its relation to externalizing behaviors such as aggression and rule-breaking. Augimeri and colleagues (2018) explored the effects of SNAP on improving self-control as a critical mechanism of change. They found significant increases in self-control, as measured by the Social Skills Improvement System (SSIS; Gresham & Elliott, 2008), in both boys and girls from the start of the program to six months follow up. These benefits were maintained over the next year. In a subsequent study, Walsh and colleagues (2018) focused on the effectiveness of SNAP for children from diverse racial backgrounds. They looked at 599 boys and girls who had participated in SNAP from 2001 and 2013. They examined the children's pre- and post- behavior problem scores using the Child Behavior Checklist (CBCL; Achenbach & Rescola, 2001) according to their racial self-identification (White, Black, Bi-Racial, Other, and Not Identified). Analyses revealed that children in all four racial groups improved significantly on their parents' CBCL ratings of rule-breaking, aggression, and externalizing scores.

Of note, the SNAP program has been adapted through cultural consultations for both Black and Indigenous children and families. Starting in the early 2000s, SNAP developers and researchers worked with Indigenous experts to co-develop a SNAP Indigenous Guide to build awareness and understanding of how to implement and culturally adapt a mainstream program, like SNAP, in Indigenous communities (see Chabbert, 2024). In 2016 the Ontario Government selected the SNAP program to be tested and possibly adapted for Black communities under the Black Youth Action Plan (see Turner Consulting & CDI, 2018a, 2018b).

Long-Term Benefits of SNAP

> *Early prevention of delinquency and later offending saves lives by diverting the very children who may embark on a life of crime and endure its consequences (Farrington & Welsh, 2007, p 167).*

To evaluate the risks faced by SNAP children and the potential long-term outcomes and benefits of the SNAP program, Augimeri obtained a court order to access criminal and death records of program participants aged 12 and older (the age of criminal liability in Canada) who had participated in SNAP since 1985, from provincial and federal authorities. As a central part of her graduate research (Hrynkiw-Augimeri, 1998; 2005), she co-developed and validated a risk/need assessment tool, Early Assessment Risk List (EARL) for children at risk of antisocial and violent behavior (described below). Augimeri and colleagues (2007) found that the number of criminal offences (obtained up to age 18) were almost halved for the children who had participated in SNAP, relative to a recreational control condition. Access to court records of SNAP children has facilitated unique follow-up studies using criminal outcome data. To date, we have analyzed three waves of data: Wave 1 (N=447, SNAP children involved from the program's inception to 1996), Wave 2 (N=953, SNAP children involved between 2001 and 2008), and Wave 3 (N=1,523, including the Wave 1 sample and SNAP participants from 2001 to 2009). In the most recent analysis (Wave 3), the mean age was 17.5 for boys and 18.5 for girls. Results indicate that approximately 68% of SNAP children are estimated to avoid contact with the criminal justice system by age 20.5. As expected, boys had higher rates of criminal justice involvement than girls (Augimeri et al., 2016). Currently, we are in the process of obtaining data for a fourth wave of analysis. In a recent study, Day and colleagues (2024) analyzed a subsample from Wave 3 (N=551) and compared it to a sample of children who were referred to SNAP but not admitted (N=525). The children were followed up to an average age of 18.06 years (SD = 3.13, range = 12–28, N=1076). The mean ages of first conviction for the SNAP and non-SNAP groups were 17.15 years (SD = 2.33, Median = 16.9, N = 64) and 17.61 years (SD = 2.33, Median = 17.2, N = 70), respectively, with no statistically significant difference between the groups (t (132) = 0.25, p = 0.25). Results indicated that 11.6% of the SNAP group and 13.3% of the non-SNAP group had at least one criminal conviction, consistent with findings from previous studies (e.g., Augimeri et al., 2012b).

To put the above findings into perspective, typically research indicates that children engaged in antisocial and/or delinquency prior to age 13 are likely to continue onto a serious violent and chronic pathway (Loeber & Farrington, 2000). The findings from these follow-up studies of youth who participated in SNAP demonstrate the positive long-term effectiveness of this early intervention in preventing delinquency for children with disruptive behavior problems and their families.

With his close connections and deep understanding of SNAP, David, along with James C. Howell and Rolf Loeber encouraged us to submit SNAP to external accreditation systems (e.g., www.crimesolutions.ojp.gov). With its comprehensive, multidimensional and evidence-based approach, SNAP has become a benchmark in children's mental health and crime prevention programming. Recognized for its robust research foundation, SNAP has earned numerous top-tier accreditation ratings (e.g., Promising to Model Plus) and is celebrated as the most fully developed and longest-running evidence-based program for addressing child delinquency (Howell, 2001; Howell et al., 2014).

David's thinking influenced every aspect of SNAP research and implementation. He guided our evaluation framework and pushed us to use stringent methods. His consultations were critical in building SNAP's evidence through robust and 'gold standard' research methods such as RCTs (Farrington, 1983) and benefit-cost analysis (Farrington & Koegl, 2015). To monitor and track SNAP development, research and implementation activities, we created the *Evidence-based Implementation, Evaluation Checklist/Barometer* (Augimeri et al., 2011; Augimeri et al., 2015). This tracking tool enables us to systematically identify the various steps and stages of SNAP program development, evaluation, research, and implementation activities. The checklist helps us assess affiliate sites' readiness, feasibility, and capacity for scaling a program, such as SNAP. Progress is registered on a Barometer, which indicates the level of completion within three stages along a continuum to establish an efficacious intervention:

1. Program Planning includes – comprehensive literature review, development of a program logic model and theory of change, use of program manual(s), and fidelity and integrity audits.
2. Process Evaluation includes – tracking the number of referrals, admission criteria, and utilization rates, and cultural competency.
3. Research and Outcome Evaluation ranging in intensity includes – client satisfaction questions, collaborative satisfaction questionnaires, qualitative analysis/focus groups, reviewing pre- post-data, quantitative analysis and standard measures, monitoring statistically significant results and sustained effects for at least one year, quasi-experimental research design with well matched comparison groups, randomized controlled trials, replications, third party external evaluations, benefit-cost analysis, and implementation science outcomes.

Importance of Risk Assessment

> *Improving the risk factor prevention paradigm is not merely an academic exercise designed to advance knowledge about explaining and preventing crime. It is also an intensely practical exercise designed to reduce crime and to improve people's lives. The twin aims of advancing knowledge and increasing the sum of human happiness are what criminology is all about (Farrington, 2000, p. 19).*

David emphasized that for crime prevention programs and initiatives to be effective, they must address the specific risks and needs of a defined target population. Therefore, assessing risks for children with behavioral problems is a necessary first step to direct them to effective prevention and intervention programs and is one of the most important challenges in the field of clinical-developmental psychology.

As he continued to guide the development of SNAP, David asked about risk factors in the lives of the SNAP children and families, which would inform the development of clinical risk management plans. As he noted, "It is important to implement effective interventions with children aged 6-11 who get into trouble, to prevent them escalating into serious, violent, and chronic juvenile offenders. Such interventions should be based on an assessment of risks and needs" (Farrington, 2012, p. 271). This critical question was linked to David's research on the Cambridge Study, which identified early risk factors linked to a criminal trajectory. He noted that, if early prevention programs target these risk factors, there can be impressive results (Farrington & Welsh, 2007). The issue was the absence of risk assessment tools specifically designed for children within the developmental criminological literature. As a result, David became extremely interested in the EARL as it focused on risk identification and risk management, which guided clinical assessments and treatment planning to meet the needs of children and their families. Over 25 years, (1996 – 2021), he participated in numerous consultation and working group sessions focused on the various EARL development projects and revisions.

The first structured professional judgment assessment scheme for boys was created and tested in 1998 (Hrynkiw-Augimeri, 1998) and then published the same year as the *Early Assessment Risk List – V1 Consultation Edition* (EARL-20B V1; Augimeri et al.,1998). After further consultation and development over two years, Version 2 was published, *Early Assessment Risk List for Boys – V2 Consultation Edition (EARL-20B*; Augimeri et al., 2001). A parallel scheme for girls was created concurrently and published as the *Early Assessment Risk List for Girls (EARL-21G*; Levene et al., 2001). In 2021, the third version of the EARL, *Early Assessment Risk List-V3* (Augimeri et al., 2021), was published. For this version, the boys and girls' risk factor lists were combined; however, the EARL-V3 maintained a gendered lens and included cultural considerations when assessing children and families' risks.

The aim of the EARL is to:

1. Increase general understanding of early childhood risk factors for clinicians and researchers;
2. Offer a structure that helps clinicians systematically identify risks to plan appropriate treatment; and
3. Improve the reliability and validity in predicting the likelihood of antisocial children engaging in antisocial behavior

The EARL is designed to balance clinical utility (e.g., service planning, resource allocation) with prediction as a "decision-enhancing" tool (Enebrink, et al., 2006). In addition, Koegl (2011), a graduate student of David's and co-author of the EARL, indicated the EARL "could also be used in a broader sense to mobilize system resources and to facilitate linkages between relevant service providers" (p. 205). To illustrate the importance of early identification of risk factors, David and colleagues (Koegl

et al., 2019) used the EARL scores to evaluate the monetary costs associated with childhood risks, including costs to victims, correctional, and other criminal justice systems. They found that boys who fell into the highest risk group based on their EARL scores in middle childhood incurred a 2.5 times higher cost (close to $900,000) in their teenage years compared to the group rated as low risk on the EARL. In a subsequent study, Koegl and Farrington (2021) investigated the relationship between childhood risk factors for antisocial behavior and monetary costs associated with criminal convictions of 379 SNAP boys. They found that the EARL helped them to quantify childhood risks in monetary terms. The EARL was valuable in helping them inform the importance of effective early intervention programs like SNAP in helping to target at-risk children before they reach the age of criminal responsibility.

David emphasized that "In preventing offending, ideally, risk and protective factors should be identified, and then risk factors should be reduced while protective factors are enhanced" (Farrington & Welsh, p. 23). Guided by this principle, we collaborated with colleagues in The Netherlands and CDI to develop the Structured Assessment of Protective Factors – Child Version (SAPROF-CV) (de Vries Robbé et al., 2023). This structured assessment tool focuses on protective factors and was designed to complement the EARL as part of the Structured Professional Judgment (SPJ) family of assessment guides for children with serious behavioral challenges.

The SAPROF-CV includes 16 empirically supported, dynamic protective factors that are amenable to change through targeted interventions. Like the EARL, the SAPROF-CV is intended to serve as a "decision-enhancing tool," aiding clinicians and practitioners in developing and guiding effective treatment plans. By integrating the SAPROF-CV alongside the EARL, we aim to strengthen the dual focus on mitigating risks and bolstering protective factors, ultimately supporting better outcomes for children facing significant challenges.

The adult (SAPROF; de Vogel et al., 2012) and youth (SAPROF-YV; de Vries Robbé et al., 2015) versions of the SAPROF have demonstrated robust evidence of their effectiveness in both research and practice (e.g., de Vries Robbe et al., 2020). While the SAPROF-CV is still in the early stages of implementation, we anticipate similarly strong evidence of its validity and utility as more data become available. Ongoing research and evaluation will be critical to confirm its effectiveness and ensure it serves as a reliable tool for enhancing protective factors and guiding intervention strategies for children with serious behavioral challenges.

Benefit-Cost Analyses

Consistent with his 1999 ASC Presidential address calling on the field to assess the monetary costs and benefits of interventions, David led evaluations of SNAP's cost-effectiveness. Through an extensive analysis including a review of the criminal records of youth who had participated in SNAP, Farrington and Koegl (2015) estimated that SNAP saves between $17 and $32 for every dollar invested, reducing crime by up to 33% (linked to an effect size = 0.4). These estimates align with analyses by the Washington State Institute for Public Policy, which reported an 86% likelihood that SNAP generates benefits exceeding its costs (Washington State Institute for Public Policy, 2018).

David strongly believed in benefit-cost analysis and determining a program's value for dollars received. He recognized that a benefit-cost analysis was one of the best ways to evaluate interventions and establish which programs prevent serious crimes with benefits outweighing costs (Farrington 2012). He teamed up with Christopher Koegl and they published the first benefit-cost analysis on SNAP (Farrington & Koegl, 2015). They found that SNAP can save significant dollars that would otherwise be spent on addressing mental health and crime within communities. SNAP's demonstrable benefit-cost analysis sees future savings of $147,423 per child with serious behavioral issues who fall within the top 2% of the general population. This cost aligns with Public Safety Canada's estimate that troubled youth with no interventions can cost society approximately $1.5M (Public Safety Canada, 2016). These costs are stark contrast with data indicating that SNAP costs only $1,000 to $8,000 per child and family depending on level of risks and needs, and the length of time in the comprehensive program

SNAP National Expansion and Beyond

> *Crime prevention should be rationale and based on the best possible evidence. One would expect that decision makers would take account of what works. How can a program that has produced no discernible evidence be considered for implementation? Unfortunately, this happens all too often* (Welsh & Farrington, 2006, p.1).

In 2000, the first SNAP implementation took place in Hamilton, Ontario at Banyan Community Services (Lipman et al., 2007, 2008, 2011). Since that time there have been more than 240 SNAP implementation sites that span Canada, United States, Europe, and the Cayman Islands. In 2012, SNAP was selected by the LEAP|Pecaut Centre for Social Impact (https://leap-pecautcentre.ca) as their inaugural social innovation to scale SNAP across Canada, pioneering a new venture philanthropy model. This initiative brought together innovative expertise from investors and private sectors (business, government, private donors and foundations) to help create massive social change in children's mental health and crime prevention in Canada. This initiative focused on developing an implementation strategy that was measurable and would bring sustainable benefits to society. The five-year (2017 – 2021) SNAP National Expansion Strategy 1.0 (Augimeri, 2017) was designed to bring SNAP to 100

communities reaching an estimated 20,000 children. Despite the worldwide pandemic and restrictions on in-person services that occurred in the middle of the five-year plan, SNAP was able to pivot and conduct virtual sessions with children and families. By the end of 2021, SNAP was implemented in 160 Canadian communities exceeding its target by 60%. In addition, there were 30 international SNAP sites (Augimeri, 2022).

In 2022, the SNAP 2.0 strategy (Banting, 2022) was launched, building on the insights and successes of the SNAP National Expansion Strategy 1.0 (Augimeri & Pepler, 2024). This new phase focuses on further advancing SNAP programming in communities across Canada and internationally. Its primary goal remains to transform the life trajectories of at-risk children and youth by enhancing their emotion regulation, self-control, and problem-solving skills, while improving mental health outcomes and strengthening crime prevention efforts.

Additionally, the strategy prioritizes increasing efficiencies in delivering children's and youth mental health programming, ensuring cost-effectiveness while maintaining the high fidelity of SNAP implementations. For example, a geo-mapping analysis conducted by the Boston Consulting Group, a business sector partner of LEAP, revealed key insights about SNAP's reach and potential impact (see Banting, 2022 for details). The analysis found that 46% (approximately 95,000) of children who could benefit from SNAP live in areas served by an existing SNAP affiliate site. Rather than establishing additional sites in these areas, the focus will shift to enhancing the capacity of these affiliate sites to serve more children and their families. Another 25% (approximately 51,000) of eligible children reside in areas outside the reach of a current SNAP affiliate site but live in communities with sufficient populations (>100,000) to make the implementation of a new SNAP site cost-effective. For these areas, expanding SNAP through new site development is a viable strategy. The remaining 29% (approximately 59,000) live in areas with populations of less than 100,000, where it may not be cost-efficient to establish a traditional SNAP site. In these communities, alternative methods of delivering SNAP programming, such as virtual SNAP services, may need to be explored to ensure these children and their families still have access to the support they need.

This approach reflects the strategy's commitment to maximizing impact and resource efficiency while expanding access to SNAP programming for vulnerable children and families across diverse communities.

Conclusion

David Farrington was a remarkable visionary who deeply understood the critical importance of assessing both risk and protective factors to inform clinically relevant and effective interventions, ultimately saving children from a lifetime of crime. In his mentoring of us, he consistently emphasized the need to prioritize rigorous SNAP research and the development of robust risk/need assessment tools to better understand and address the complex needs of children engaged in antisocial behavior and their families. David recognized that early identification and intervention are essential to disrupting the seven-year incubation period that places high-risk children on a trajectory toward criminal behavior. With his unwavering commitment to bridging the science and practice of criminology, he became a champion for SNAP and the EARLs as catalysts for meaningful change.

He entrusted us with a profound call to action: to continue this critical work with the same grit, passion, and courage he exemplified, ensuring these evidence-based approaches reach a significant proportion of children and families. This requires a unique form of leadership—one that integrates a scientist-practitioner framework and appreciates the developmental-relational underpinnings of children's antisocial behavior (Pepler et al., 2025).

David's legacy highlights the necessity of blending program development and intervention with a deep commitment to research. By elucidating the mechanisms of change and fostering effective, sustainable programs, his work continues to guide us in transforming lives and creating lasting impact. Perhaps one of David's most enduring messages was that it is "never too early" to intervene in a child's life - and never too late to make a difference (Farrington & Welsh, 2007). His mentorship and vision remind us of the profound impact we can have by translating science into action and moving effective interventions into broader policy and practice. We leave with you David's vision that national governments along with researchers and community partners invest in a national council to support and monitor the implementation of evidence-based early intervention programs and crime prevention strategies to divert at-risk children from a life of crime.

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Predicting health service use in antisocial children using the early assessment risk list for boys (EARL-20B)

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Abstract

Purpose of the Study: To examine the relationship between the Early Assessment Risk List for Boys (EARL-20B) total and item scores and the prevalence of health service use, disease and mental health status in a sample of antisocial boys, followed up between the ages of 12 and 21.

Methods: information contained in clinical files of 234 boys seeking treatment for conduct problems was used to rate each of the twenty EARL-20B risk factors (0-1-2) to yield total scores ranging between 0 and 40. Provincial health records were used to derive health outcome variables based on outpatient, emergency room and inpatient encounters, and to facilitate analyses based on ICD-9 disease categories and specific mental health diagnostic variables.

Results: significant associations were found between the EARL-20B total score and emergency room use, particularly for encounters due to accidents and injuries. Total EARL-20B scores also predicted mental and behavioural problems such as mood and anxiety disorders and disorders of childhood and adolescence. Using logistic and linear regression, several individual EARL-20B items were identified as significant predictors of these outcomes.

Conclusions: This study showed that the EARL-20B, initially designed to assess risk for later criminality in children, also predicted health and mental health outcomes previously shown in the literature to be associated with conduct disorder. Study findings support the addition of accident prevention and health promotion training and education in interventions targeted at antisocial children and their families.

Keywords: conduct disorder, behavioural problems, risk assessment, health service use, mental health, disease

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Predicting health service use in antisocial children using the early assessment risk list for boys (EARL-20B)

Introduction

In Criminology, it is often said that when it comes to addressing the problem of crime, all roads lead to prevention and early intervention: offering programs early in the lives of antisocial children is the most promising and cost effective way to prevent their involvement in criminal activities later in life. From this conclusion, it can also be said that the same roads lead directly back to David Farrington whose prolific body of work on risk and protective factors led to the creation of developmental crime prevention (DCP), not only as a conceptual framework, but as a policy imperative. His transformative texts on this subject include *Serious and Violent Juvenile Offenders: Risk Factors and Successful Interventions* (Loeber & Farrington, 1998), *Child Delinquents: Development, Intervention, and Service Needs* (Loeber & Farrington, 2001), *Saving Children from a Life of Crime* (Farrington & Welsh, 2007), *The Oxford Handbook of Crime Prevention* (Welsh & Farrington, 2014), and *What Works in Crime Prevention and Rehabilitation: Lessons From Systematic Reviews* (Weisburd, Farrington & Gill, 2016). David's work has repeatedly emphasized that high quality evaluations (i.e., randomized controlled trials, quasi-experimental studies) show the best promise of advancing evidence-based DCP initiatives. To this point, reviews of systematic reviews demonstrate that well-designed and rigorously evaluated programs can produce substantial positive treatment effects (e.g., Farrington, Gaffney, Lösel, & Ttofi, 2017; Weisburd, Farrington, & Gill, 2017) that translate into monetary cost savings over time. In the most recent review of cost-benefit evaluations of DCP programs, Koegl, Farrington and Welsh (2023) found that for every dollar invested, DCP programs returned benefits ranging between 35 cents to 32 dollars depending on the scope of outcomes analyzed. Although crime accounts for a substantial proportion of these savings (i.e., averting victim costs), antisocial children impose a substantial economic burden in other sectors such as healthcare, education, child welfare, addictions, and mental health (e.g., Crescenzi et al., 2024; Foster, Jones, & Conduct Prevention Research Group, 2005; Goulter et al., 2024; Rissanen et al., 2022; Romeo, Knapp, & Scott, 2006; Scott, Knapp, Henderson, & Maughan, 2001). It follows that crime prevention strategies that are grounded in restorative, holistic, non-punitive paradigms are capable of achieving monetary savings in these other domains as well (Dodge, 2008; Mackenzie & Farrington, 2015; Welsh & Farrington, 2007).

The Relationship between Conduct Disorder and Adverse Health Outcomes

A substantial body of research reveals that conduct disorder is associated with a wide variety of negative health and mental health outcomes in both adolescence and adulthood. These include, but are not limited to an increased risk for: suicidal behaviours (Beautrais et al., 1996; Darke, Ross, & Lynskey, 2003; Wertz et al., 2018), tobacco, alcohol and cannabis use (Erskine et al., 2016; Kretschmer et al., 2014), illicit drug addiction (Fergusson, Horwood, & Ridder, 2005), anxiety and depression (Colman et al., 2009; Stringaris, Lewis & Maughan, 2014), psychotic and antisocial personality disorders (Erskine et al., 2016; Kim-Cohen et al., 2003; Sourander et al., 2005), antidepressant use (Lichtenstein et al., 2020), sexually transmitted diseases (Lin et al., 2021), and premature death (Shepherd, Shepherd, Newcombe and Farrington, 2009).

Using a prospective longitudinal study design in Dunedin, New Zealand, Odgers and colleagues (2007) evaluated 526 boys with a persistent pattern of antisocial behaviour to determine if they were more likely to experience adverse health outcomes between the ages of 7 and 32. Using Moffitt's (1993) developmental taxonomy of antisocial behaviour to construct comparison groups, their analyses revealed that the most severe "life course persistent" (LCP) boys had substantially increased odds of manifesting a wide range of health problems at follow up compared to boys with low levels of conduct problems. Looking at the three largest odds ratios, LCP boys were 25.6 times more likely to have a history of attempted suicide, 21.5 times more likely to be dependent on drugs, and were 18.7 times more likely to be hospitalized for a mental health condition. Rivenbark and colleagues (2018) repeated this analysis on the same sample but extended the follow-up period an additional six years to capture health service use up to age 38. They found that, compared to low conduct problem children, the LCP group accumulated three times as many of emergency department visits and 84% more health encounters resulting from injuries. In another study of 801 children aged 7 to 42 in Providence, Rhode Island, Paradis and colleages (2016) also used trajectory analysis to classify individuals into three antisocial behaviour risk groups (i.e., persistent, adolescent-limited, no problems). They found that the persistent group was more than twice as likely to suffer a serious injury (*OR*=2.16) or seek medical help in an emergency department (*OR*=2.38) during the preceeding year, compared to the no-problem group.

A review of the pediatric injury literature reveals that unintentional injuries are the leading cause of death among children and adolescents (e.g., Heron, 2021). Moreover, research shows that children with disruptive behaviour disorders in childhood such as ADHD, ODD and CD are more vulnerable to suffering injuries later in life (Brehaut, Miller, Raina, & McGrail, 2003; Bruce, Kirkland, & Waschbusch, 2007; Langley, McGee, Silva, & Williams, 1983). In a British birth cohort study, Jokela, Power, and Kivimäki (2009) assessed 11,537 children at ages 7, 11, and 16 and parental measures of externalizing behaviour problems with self-reported injuries at ages 23, 33 and 42. Their findings revealed that for every one SD increase in externalizing problems, there was a corresponding 10–19% increase in the rate of injuries at all follow-up ages. Agnafors, Torgerson, Rusner, and Kjellström (2020) examined administrative public health records in a Swedish population-based study of individuals from birth up to age 17. Their analysis showed that having a diagnosis of ODD/CD in childhood increased the odds of suffering a fracture or concussion by 45%. Lastly, Temcheff et al. (2023) compared 744 children who were assessed by their parents as having or not having conduct problems between the ages of 6 and 9. Controlling for gender, household income, and comorbid ADHD, they found conduct problems in childhood was the only significant predictor of subsequent injuries (e.g., fractures, burns, concussions, cuts) up to age 16.

Taken together, these studies demonstrate a heightened vulnerability among conduct-disordered children for adverse health outcomes later in life. It is important to acknowledge, however, that the aforementioned studies predominantly employed categorical, behavior-based constructs to predict health service use and their related clinical outcomes. Although antisocial behavior itself is a strong predictor of a variety of negative outcomes, its narrow focus limits our understanding of other potential explanatory, causal factors and mechanisms that could be contributing to these outcomes. A core feature of the DCP paradigm is the integration of evidence-based assessment and intervention strategies designed to address the broad spectrum of individual, family, peer, and contextual influences affecting at-risk children and their families. In this context, the books by David Farrington and colleagues referenced earlier offer a detailed compilation of risk factors that have consistently emerged as reliable predictors of antisocial behavior. Notably, this extensive body of research formed the empirical foundation and incentive for developing the Early Assessment Risk List for Boys (EARL-20B; Augimeri, Koegl, Webster, & Levene, 2001).

The Early Assessment Risk List for Boys (EARL-20B)

The EARL-20B was developed to assess general risk for future antisocial behavior in clinic-referred boys aged 6-11 manifesting high levels of conduct problems. Along with its companion guide for girls (EARL-21G; Levene et al., 2001), the EARLs are the only multifaceted risk assessment tools targeted at this specific age group, although other risk assessment guides have been created to assess antisocial potential in children and adolescents. The most notable of these include the CRACOW for children under age six (Corrado & Freedman, 2011), the SAVRY for adolescents aged 12-18 (Borum, Bartel, & Forth, 2006), and the YLS/CMI for youth aged 12-18 in correctional settings (Hoge & Andrews, 2011).

The EARL-20B is grounded in the *structured professional judgement paradigm* which seeks to bridge the gap between scientific research on risk factors and front-line clinical practice (Haque & Webster, 2019; Hart, Douglas, & Guy, 2016). Its purpose is threefold: (1) to increase understanding of early childhood risk factors for future antisocial behavior; (2) to help clinicians working with antisocial children to construct risk assessment schemas using structured formats and defined variables; and (3) to assist in the creation of effective, evidence-based clinical risk management plans for high-risk boys and their families (Augimeri, Enebrink, Walsh, & Jiang, 2010). The EARL-20B contains 20 items, divided into three domains of risk: Family, Child, and Responsivity. Each individual risk factor is assessed as *not present* (0), *possibly present* (1), *or present* (2) to yield a total score between 0 (little to no risk) and 40 (extremely high risk). Although the total score is often used as a summary measure of risk, individual EARL-20B risk factors are typically used by clinicians to target specific areas of concern for treatment planning. The most comprehensive study of the EARL-20B to date examined its ability to predict future criminal offending a sample of 379 antisocial boys using official criminal records (Koegl, Farrington, & Augimeri, 2021). Results revealed significant associations between EARL-20B total scores and various measures of criminal offending between the ages of 12 and 20. Additional analyses on the same sample of boys further showed that higher EARL-20B scores predicted victim and criminal justice costs over the same follow-up interval (Koegl & Farrington, 2021).

The Present Study

Given the strong link between conduct disorder, adverse health outcomes and childhood injuries, it was important to explore whether the EARL-20B could also be used to predict these outcomes. As noted earlier, previous studies have typically examined this association by using behavioural measures (e.g., conduct disorder) to predict future health service use. However, no research to date has operationalized a multidimensional risk assessment tool to predict such outcomes. This study therefore aimed to fill this gap by examining the association between EARL-20B total and individual item scores and a variety of health service use and disease outcomes using real-world, public health utilization data. The study had three primary objectives:

1) To explore the association between EARL-20B total scores and the prevalence and frequency of health service utilization and disease;
2) To evaluate whether the EARL-20B can predict specific mental health disorders; and
3) To determine whether individual EARL-20B items are significant predictors of these outcomes.

Materials and methods

Participants

EARL-20B assessments were derived from a retrospective coding of closed clinical case files for 379 boys who attended the Stop Now And Plan Under 12 Outreach Project (SNAP-ORP) in Toronto, Canada between 1985 and 1999. Housed within the Child Development Institute (CDI), the SNAP-ORP is a 12-week cognitive-behavioural program for children between the ages of 6 and 11 in conflict with the law (see Augimeri, Farrington, Koegl, & Day (2007); Farrington & Koegl (2015); Koegl, Farrington, Augimeri, & Day (2008) for descriptions and evaluations of the program, and Koegl, et al. (2021) and Koegl & Farrington (2021) for evaluations of the EARL-20B in relation to criminal outcomes).

At intake to the program, the average age of participants was 9.6 years (*SD* = 1.4, *range* = 6–11). Boys were referred to the program by a variety of sources, but most often this was the police (53%), followed by schools (12%), another CDI program (12%), child protection (11%), or another source (12%). The top five presenting problems prompting referral were disobedience (74%), stealing/theft (72%), assault/aggression (71%), lying (64%), and verbal aggression (51%). Most boys were living with a single parent at the time of admission (48.1%), followed by an intact family (27.4%), a reconstituted family (12.2%), a common-law relationship (7.2%), a guardian (2.7%) or another arrangement (2.4%).

EARL-20B Risk Assessments

As noted earlier, the EARL-20B is divided into 20 factors, organized under three categories of risk: *Family*, *Child*, and *Responsivity* (Table 1). Six Family items assess parental influences, including nurturing, supervision, and available supports or stressors in the boy's immediate home environment. Twelve Child items focus on a range of individual characteristics related to academic performance, peer relationships, coping strategies, and the appropriateness of his behaviour and attitudes. The two Responsivity items focus on the boy's and family's history and willingness to engage with treatment interventions. Individual items are scaled so that higher scores are indicate higher risk. Each risk factor is rated on a three point scale as, *not present* (0), *possibly present* (1), or *present* (2) to produce a total risk score ranging from 0 to 40. To improve the accuracy of scoring, evaluators are encouraged to obtain and assess information from multiple agents (e.g., teachers, parents, caregivers, doctors) across multiple sources (e.g., clinical records, school reports, standardized tests). Prior research has shown that the EARL-20B has acceptable interrater reliability and validity (for summaries, see Augimeri et al., 2010; Koegl, Augimeri, Ferrante, Walsh, & Slater, 2008).

For this study, closed clinical case files were coded by three independent raters with advanced academic degrees and experience in the social sciences as part of the initial validation and reliability studies of the EARL-20B (Augimeri et al., 2010; Hrynkiw-Augimeri, 2005). EARL scores were derived from the totality of the clinical file which captured their 12-week timeframe of involvement in the SNAP-ORP program. Ratings were based on clinical notes, parental reports, standardized measures and information forms, case conference reports, reports from collateral agencies, child and parent group treatment progress reports and a SNAP program termination report. Scores for each of the 20 individual items (0, 1, or 2) were generated for each participant to yield a total maximum score of 40. Raters were blind to all outcome measures when they completed EARL-20B assessments.

Health Service Use, Disease, and Mental Health Outcome Data

Access to health datasets was granted by the Institute for Clinical Evaluative Sciences (ICES), Toronto, Canada after receiving ethics approval from the Research Ethics Board at Sunnybrook Hospital. Health data are curated by ICES which has a mandate to perform epidemiological research that improves the health of Ontarians. These data encompass real-world, public health system service use events, as provided by the Ontario Ministry of Health and Long-Term Care and the Canadian Institute for Health Information (CIHI). Datasets housed at ICES contain patient-level data for the population of individuals who reside in Ontario, Canada. Five datasets were used to construct health service outcome and disease variables for this study.

Registered Persons Database (RPDB). The first step in constructing an aggregated health outcome dataset was to locate the 379 SNAP-ORP boys in the RPDB which contained roughly 16 million current and historical records of individuals residing in the province of Ontario. Personal identifiers (i.e., date of birth, surname, given names, postal code, and Ontario health card numbers) were transcribed from the SNAP-ORP clinical files. These identifiers were subsequently used with deterministic and probabilistic linkage algorithms that identified nearly all (*N*=365 or 96.4%) of the original study participants. Once matched, personal identifiers were stripped away and replaced with a unique key number that was subsequently used to link individuals in other databases.

Ontario Health Insurance Plan (OHIP). OHIP is a fee-for-service plan that captures the largest proportion of health care expenditures in the province of Ontario. At the time of data collection, roughly 94% of all medical doctors in Ontario had a fee-for-service practice. OHIP

records were coded to include: (a) the diagnosis issued by the health care professional providing the service; (b) the date the service was provided; and (c) the feecode which describes the service type. Using the feecode variable in the OHIP dataset, it was possible to code for two general locations where medical services were provided: those that occurred in an emergency room (ER), and those that took place elsewhere, the latter of which constituted "outpatient" encounters.

Discharge Abstract Database (DAD) and Same Day Surgery (SDS). These data sources capture hospital inpatient admissions, or more accurately, "separations" from hospital in the province of Ontario. For these datasets, one record represents one separation from hospital which can last for one or more days for the DAD or less than a 24-hours for the SDS. Similar to the OHIP database, DAD and SDS records were coded to calculate the length of stay for each registered hospital visit, and disease codes based on the International Classification of Diseases (ICD) scheme, a globally recognized system by the WHO for coding and classifying diseases, symptoms, and health conditions.

Ontario Mental Health Reporting System (OMHRS). This database captures hospital inpatient stays for which the most responsible diagnosis was specifically a mental health problem. (Prior to 2005, these hospitalizations were captured in the DAD.) Like the DAD and SDS records, OMHRS variables were coded to yield length of stay and ICD diagnostic codes for each hospitalization.

OHIP diagnosis codes were originally based on the ICD-9 classification system which was subsequently replaced by ICD-10 in 2002. Analysis of the frequency of OHIP encounters revealed that there were over 400 separate codes represented across more than 14K records in the dataset. Because the OHIP database contained the majority of cases for analysis, ICD-9 was used as the organizing framework to construct health outcome variables. To align diagnoses across datasets (OHIP, DAD, SDS, OMHRS), a coding system was was developed assign each code into one of seventeen broad disease categories (shown later in Table 3). Using ICD and OHIP codes, it was further possible to derive the following variables to examine service use for five specific mental health disorders: 1) substance use disorder (e.g., alcoholism; drug dependence); 2) psychotic disorder (e.g., schizophrenia, paranoid states); 3) personality disorders (e.g., borderline); 4) mood and anxiety (e.g., depression, anxiety); and 5) disorders of childhood & adolescence (e.g., conduct disorder, ODD, ADHD).

Creating a Uniform Follow-Up Interval and Case Exclusion

Establishing a uniform follow-up interval for health outcomes was essential for several reasons. Most notably, boys were admitted to the SNAP-ORP program continuously from 1985 to 1999, meaning they were not the same age at the time of follow-up and, consequently, had varying levels of exposure to the healthcare system. Standardizing the follow-up period ensured that health service utilization was assessed during the same developmental stage for all participants. This was critical because the prevalence of diseases and the associated exposures to health risks were not assumed to be uniform across different ages. Age 12 was chosen as the start date for measuring health outcomes because preliminary analyses revealed that very few participants had full health system coverage from their discharge from the SNAP-ORP program to their 12th birthday. Similarly, a sensitivity analysis revealed that age 21 was the optimal cutoff that produced the largest sample of participants will full health coverage (N = 247). To further ensure that study participants had an opportunity to register health events across the follow-up interval, three additional exclusionary criteria were applied: (1) participants had to be alive, (2) had at least one health system contact, and (3) resided in the province of Ontario between their 12th and 21st birthday. Applying these additional criteria resulted in a further reduction of the sample of 13 cases, resulting in a final sample of 234 cases for analysis (61.7% of the original sample of 379 boys).

Analytical Approach

Chi-squared tests and logistic regression were used to test for differences for categorical variables (i.e., *prevalence* of disease, health encounters). Analyses of Variance (ANOVA) and OLS regressions were used for continuous variables (i.e., *frequency* of health encounters). Logarithmic transformations were applied to variables with skewed distributions to satisfy tests requiring assumptions of normality. Where appropriate, test statistics were calculated using log-transformed values, however, raw means and standard deviations are reported below for ease of interpretation.

EARL-20B total risk was operationalized as both categorical and continuous variables. For the former, the distribution of EARL total scores was split into thirds to yield three groups of roughly equal size denoting "low," "moderate," and "high" risk groups (Table 2). This approach was taken because trichotomisation has been previously shown to be a useful approach when comparing subgroups within distributions, especially in relation to logistic regression analyses (Farrington & Loeber, 2000; Stouthamer-Loeber et al., 1993). However, and in order to increase confidence that significant differences between categorical groups were not artefacts of cut-point selection, linear and logistic regressions were performed using continuous total EARL-20B scores to assess the robustness of between-group differences.

In cases where there was a significant association the EARL-20B total score and a specific health outcome variable, follow-up analyses were performed to assess whether specific EARL-20B items were significant independent predictors. To do so, each of the 20 EARL items was correlated with the relevant health outcome variable. Bivariate correlations with P-values of 0.10 or less were

subsequently entered into forward stepwise regressions. The decision to isolate a smaller number of independent predictors was made in order to minimize the potential negative influence of multicolinearity when fitting regression models (Tabichnick & Fidell, 2007). Models were configured with an entry P-value of .10 and removal P-value of .99. The latter was done in order to isolate significant independent predictors, and not build predictive models *per se*. This analytical approach for identifying important risk factors has been used previously with success (e.g., Farrington, Loeber, Jolliffe, & Pardini, 2008).

Analyses of disease prevalence and health service use for each of the ICD disease categories resulted in a large number of statistical tests which increased the possibility of Type I errors (rejecting the null hypothesis when it is true). Some researchers have argued in favor of applying the Bonferroni p-value correction to deal with this problem. However, this approach has attracted strong criticism for the possibility of increasing Type II errors (failing to reject the null hypothesis when it is false), thereby reducing statistical power (e.g., Feise, 2002, Nakagawa, 2004; Perneger, 1998). For this reason, and given the exploratory nature of the study, Bonferroni corrections were not applied. Instead, emphasis was placed on the magnitude of effect sizes: these included standardized parameter estimates (*Beta* or β) for linear regression, odds ratios (*OR*) for logistic regression, and product-moment correlation coefficients (*r*). For product-moment correlations, Cohen (1992) refers to values around .10 to be small, .30 to be medium, and .50 to be large effect sizes, respectively.

Results

Health Service Use

Looking at OHIP data, the 234 males in the sample accrued 14,101 health service encounters between the ages of 12 and 21. Most of these (93.3%) were encounters in outpatient settings; 6.7% represented encounters in an emergency room (ER). All boys had at least one outpatient visit and 80.8% had one or more ER visit. Based on SDS, DAD and OMHRS data, roughly one quarter of participants (25.2%) had at least one inpatient hospitalization. Using the EARL-20B total score as a measure of cumulative risk, chi-squared tests revealed no differences among EARL-20B risk groups in terms of the *prevalence* of ER visits or inpatient hospitalizations. These null findings were confirmed via logistic regression analyses that operationalized the EARL-20B total score as a continuous variable.

When examining the *frequency* of health service use, an ANOVA revealed that boys in the high-risk group had significantly more ER encounters compared to boys in the low-risk group, roughly 1.2 more, on average (see Table 3). The ANOVA result was statistically significant ($F(2,186) = 3.97$, $p < .05$). This finding was further supported by an ordinary least squares (OLS) regression, which treated the EARL-20B total score as a continuous predictor variable. The regression confirmed the association ($R^2 = .026$, $F(1,188) = 5.03$, $p = .026$) with a corresponding effect size (r) of .16. No significant differences were observed among EARL-20B risk groups for any of the other types of health services.

Were any individual EARL-20B risk factors associated with either the prevalence or frequency of ER use? For the *prevalence* of ER attendance, five EARL-20B items were included in a logistic regression model. As shown in Table 4, four emerged as significant independent predictors: (C4) having hyperactivity, impulsivity, or attention deficit problems; (C9) having police contact; (R2) being unresponsive to treatment; and somewhat counterintuitively, (C8) *engaging* in structured community activities (noting that C8 is scaled so that a lower score indicates more participation). Among these, item C4 was the strongest predictor ($OR = 3.55$, 95% CI: 1.82-6.91, $p < .001$) that increased odds of ER contact by more than threefold. Similarly, being unresponsive to treatment (R2, Child Responsivity) more than doubled the odds of accessing treatment in an ER. A possible explanation of the latter finding is that boys who were not receptive to interventions for their behavior problems may be similarly less likely to seek proactive medical care, instead relying on services only when their issues have escalated to a level requiring emergency attention.

For the *frequency* of ER attendance, correlations were calculated using log-transformed count variables for individuals who had attended an ER at least once ($N = 189$). The bivariate correlations and results of the regression model are presented in the right-hand column of Table 4. Of the seven EARL-20B items entered into the forward stepwise regression model, three emerged as significant independent predictors of ER frequency: (C2) early onset of behavioral difficulties, (C1) absence of developmental problems, and (C11) high levels of antisocial behavior. Among these, C2 was the strongest predictor, indicating that boys with an earlier onset of behavioral difficulties were more likely to accumulate more frequent ER encounters. One possible explanation for these findings is that, in the absence of community programs, parents brought their sons to the emergency room seeking treatment for their acute behavioural problems. The negative association with item C1 indicates that boys with early developmental problems were less likely to end up in the ER. This finding is consistent with studies suggesting that parents of children with developmental disabilities may be more reluctant to access ER services because the ER environment is often ill-equipped to adequately address their child's needs (e.g., Elliott et al., 2024).

Predicting Disease

The next series of analyses examined the relationship between EARL-20B scores and the prevalence of disease based on ICD-9 categories. Dichotomous variables were created to capture whether individuals were *ever* treated for any of the health problems listed in Table 5 based on outpatient, emergency room, and inpatient service en-

counters. Analyses indicated that there were no significant differences among the three EARL-20B risk groups across disease categories with the exception of Category 5 (Mental and Behavioral Disorders): high-risk boys were significantly more likely to receive treatment for a mental or behavioral disorder compared to low-risk boys. This was supported by a three-group chi-square test ($\chi^2(2) = 9.42$, $p = .009$) and a logistic regression model treating the EARL-20B total score as a continuous variable (*OR* = 1.07, 95% CI: 1.01–1.13, *B* = .066, *SE(B)* = .028, $\chi^2(1) = 5.57$, $p = .018$).

Analyses focusing on the relationship between the EARL-20B total score and the *frequency* of health service included the first 16 disease categories with sufficient cases to permit statistical analysis for outpatient and ER encounters (see Note, Table 5; inpatient admissions were excluded due to small numbers). There were no differences among risk groups for the 11 disease categories tested for outpatient care. Across the five comparisons involving ER encounters, a significant difference emerged among the risk groups specifically for Category 16 (injuries, poisonings, and external causes of morbidity). An ANOVA showed that high-risk boys (*M* = 2.73, *SD* = 3.50) had more ER encounters than moderate-risk (*M* = 2.12, *SD* = 2.42) and low-risk boys (*M* = 1.77, *SD* = 2.10); ($F(2,163) = 3.61$, $p = .029$). This finding was supported by linear regression analysis (*B* = .007, *SE(B)* = .003, $t = 2.44$, $p = .016$).

To identify significant independent predictors of accidents and injuries, individual EARL items were correlated with the dichotomous injury variable, resulting in three significant correlates (F2, C3, C8). Logistic regression modeling revealed that two of these EARL-20B items measuring abuse, neglect, and trauma (C3), and participation in structured community activities (C8) were significant independent predictors, with associated odds ratios of 1.95 (95% *CI*: 1.10-3.44) and 0.33 (95% *CI*: 0.16-0.66), respectively ($\chi^2(2) = 17.52$, $p < 0.001$).

Mental Health Outcomes

Based on all outpatient, ER, and inpatient encounter data, it was possible to use ICD and OHIP codes to drill down into the "Mental and Behavioural Disorders" category and generate five discrete, dichotomous mental health disorder variables: 1) substance use disorder; 2) psychotic disorder; 3) personality disorder; 4) mood and anxiety disorder; and 5) disorders of childhood and adolescence. Each of these variables was subsequently compared with EARL-20B total scores to determine whether high risk boys were more likely to be treated for these conditions.

Table 6 shows that there were no differences among risk groups for the prevalence of substance use disorders (at about 18%), personality disorders (at about 16%) or psychotic disorders (at about 7%). However, higher EARL-20B risk scores were associated with a higher prevalence of health service use for mood and anxiety disorders, or disorders of childhood and adolescence. As Table 6 shows, these differences were statistically significant for tests based on both categorical and continuous predictor variables.

The next series of analyses focussed on *whether* individual EARL items were associated with these conditions. Initial analyses focusing on mood and anxiety problems revealed that five of EARL-20B items were significantly correlated (i.e., F2, C3, C11, C12, R2). For the logistic regression, only the EARL-20B item measuring abuse, neglect, and trauma (C3) remained a significant predictor, with a corresponding odds ratio of 1.62 (95% CI: 1.18–2.25, $\chi^2(1) = 9.09$, $p < 0.01$). This indicates that experiencing abuse, neglect, or trauma before age 12 was associated with a 62% higher likelihood of receiving treatment for a mood/anxiety disorder between ages 12 and 21.

Disorders of childhood and adolescence are defined in the DSM-IV to include a broad spectrum of problems, for example, but not limited to: learning and communication disorders, developmental disorders, conduct disorder, oppositional defiant disorder, attention-deficit and hyperactivity disorder, and eating disorders of early childhood (American Psychiatric Association, 2022). When Pearson correlations were calculated for each of the EARL-20B risk items, 10 met the criterion for inclusion in the logistic regression model (C2, C3, C4, C6, C7, C9, C10, C11, C12, and R2). Of these, only two remained significant independent predictors: having hyperactivity, impulsivity, or attention deficit problems (C4; OR = 2.09, 95% CI = 1.39–3.15, $p < .001$) or having antisocial peers (C6; OR = 1.87, 95% CI = 1.24–2.83, $p < .01$). The resulting model was highly significant ($\chi^2(2) = 25.95$, $p < .001$). The significant association with C4 might be indicative of the continuity of hyperactivity, impulsivity, and attention deficit symptoms from childhood into adolescence and early adulthood. Additionally, associating with antisocial peers (C6) in childhood increased the odds of being treated for one or more disorders of childhood and adolescence by 87%. Due to the nature of the OHIP data, however, it was not possible to disaggregate outcome variables to examine whether specific childhood diagnoses within each category were more strongly associated with items C4 or C6.

Discussion

The analyses presented in this paper provide new insights into the relationship between EARL-20B total and individual item risk scores and public health service use. It was shown that a multidimensional risk assessment tool, originally created to predict future antisocial behaviour in young boys, can also be used to forecast a range of health service use, disease, and mental health conditions in adolescence and early adulthood. One of the main findings of the study was that the total EARL-20B score was a significant predictor of frequency of ER use, indicating that children at higher risk for future antisocial behaviour ac-

cessed emergency medical care for acute health problems, most often stemming from accidents and injuries requiring immediate medical attention. Looking at individual EARL item predictors, there were some interesting differences between items that predicted prevalence and frequency of ER use. For prevalence, being hyperactive, impulsive or having attendtion deficits (C4), having police contact (C9), engaging in community activities (C8) and not being amenable to treatment (R2) predicted *whether* boys accessed emergency care. Once there, the level (C11) and onset (C2) of their behaviour problems and a lack of developmental deficits (C1) contributed to the frequency of ER attendance.

As reviewed earlier, the associations between impulse-control problems, childhood behaviour disorders and accidents and injury are well-documented in the literature (e.g., Brehaut et al., 2003; Davidson, 1987) and these were replicated in the current study. Item C4 was the strongest predictor (*OR* = 3.55) which can be interpreted as boys who were positively identified as having one or more of these problems (i.e., scored 2) were more than 12 times as likely (i.e., 3.55 X 3.55 = 12.60) to attend an emergency room compared to boys without these problems (i.e., scored 0). Impulsive people tend not to think before they act and, as such, may take more risks increasing their odds of injury. This line of reasoning is consistent with prior research (e.g., Bruce et al., 2007). Importantly, the large effect size underscores the need to account for disruptive attention and behavioral regulation traits when developing treatment plans for children with conduct problems.

The strong negative association (OR = .32) between structured community activities (C8) and ER use was unexpected. Although conceptualized as a protective factor to mitigate participation in crime, the odds of ending up in an emergency room increased nearly tenforld (1/.32 X 1/.32 = 9.76) for those who engaged in such activities (i.e., scored 0) compared to those who did not (i.e., scored 2). One explanation for this finding is that the sport and recreational programs that the boys participated in provided additional opportunities to become injured. In addition to individual factors such as impulsivity and risk taking (i.e., captured under item C4), Schwebel (2006) highlights additional contextual factors that may play a role in sustaining injuries such as the availabilty of peers modeling of risk-taking behaviors, or a lack of adequate adult supervision. The key takeaway from this finding is that while participation in community-based leisure programs may provide a protective function for criminal outcomes, it may impose increased health risks. Clinicians working with antisocial children should be mindful of this when recommending or encouraging involvement in such activities.

Logistic regression analysis also showed that experiencing abuse, neglect, or trauma (C3) in childhood increased the odds of sustaining injuries between the ages of 12 and 21 by a factor of 3.8 (i.e., 1.95 × 1.95). This might reflect a continuity of abuse from middle childhood into adolescence and early adulthood (e.g., injuries sustained at the hands of caregivers) -- events that may increased the need to access healthcare. It is also possible, consistent with explanations provided by Schwebel (2006), that the absense of supervision or profound neglect may have created an environment where kids were able to engage in more risk-taking activities resulting in serious injury.

Analysis of overall health service use by ICD-9 categories revealed only one significant difference among EARL-20B risk groups: higher EARL-20B total scores were associated with a higher prevalence of mental or behavioural disorders. An examination of specific mental health diagnoses showed that total EARL-20B scores predicted a higher prevalence of illness for two of the five disorder categories tested: mood and anxiety disorders, and disorders of childhood and adolescence. No significant relationships were found between the total score and personality, psychotic and substance use disorders. These latter null findings are not surprising since their onset and diagnosis typically occurs later in adolescence and adulthood. Still, it was hypothesized that there would be a significant association between the total EARL score and substance use disorders given prior research (Brook & Cohen, 1992; Dobkin, Tremblay, & Masse, 1995; Sourander et al., 2005). For substance use disorders specifically, the lack of a positive association might also be explained by the fact that most of the health encounters measured in the current study took place within a general physician context which, in comparison to specialized addictions or concurrent diagnosis programs, may be less equipped to reliably diagnose such problems (Bennett, Bellack, & Gearon, 2006).

It is not surprising that the single EARL-20B item measuring early childhood abuse, neglect and trauma (C3) was associated with health care related to mood and anxiety problems. There is abundant research that demonstrates that maltreated children are more likely to experience subsequent internalizing problems (e.g., Afifi et al., 2008; Kalmakis et al., 2015; Kaplow & Widom, 2007). Using individual EARL-20B items to predict the prevalence of disorders of childhood and adolescence identified two significant predictors: peer socialization (C6) and hyperactivity, impulsivity, and attention deficits (C4). The significant association with C6 may reflect the well-established link between conduct disorder and antisocial peers (e.g., Gallupe et al., 2019). Unfortunately, as noted earlier, the data could not be disaggregated into specific diagnoses to test the association with conduct disorder directly. In contrast, the association with C4 would be anticipated because the diagnostic category aligns with the same disorders assessed under item C4. This interpretation is further supported by epidemiological research showing that ADHD is typically diagnosed in childhood and often persists into adolescence and adulthood (Barbaresi et al., 2013; Visser et al., 2014).

Taken together, this study adds to the expanding body of research examining the relationship between early

childhood conduct problems and health problems later in life. The study had several strengths which included the use of a multi-dimensional index of risk which allowed the simultaneous consideration of a wide range of risk factors (Schwebel & Gaines, 2007). Second, health outcomes were measured using official administrative databases which had the advantage of increasing external validity and minimizing participant bias associated with self-reported measures. Third, the follow-up period spanning nine years allowed for a robust test of the EARL-20B's predictive power during adolescence and early adulthood. Lastly, the consideration of all ICD disease categories in the analysis provided a more exploratory view of health data, avoiding the limitation of shortlisting specific diseases, as observed in prior studies (e.g., Odgers et al., 2007).

With these strengths in mind, several limitations warrant consideration. Chief among them is the lack of clarity regarding the causal relationships between predictor and outcome variables. To qualify as a true risk factor, a variable must temporally precede the outcome it is believed to influence (Kraemer et al., 1997). For this reason, researchers distinguish between "risk factors" as causal agents and "risk markers" that may more accurately represent a correlational relationship between variables (Mulvey, 2005). Although each of the risk factors in the EARL-20B was scored prior to the measurement of the health outcome variables, it is not known whether they were mediated by developmental processes or other intervening, unmeasured factors. For example, it was possible that study boys had underlying health problems that preceded the onset of risk factors that were measured during their involvement in the SNAP-ORP program. Such a limitation could be addressed by furture research that includes historical health service use as a control variable in prediction models. Second, reliance on official records for measuring health outcomes limited the data to services within the public system, excluding private care or other forms of treatment. Finally, the absence of a non-antisocial comparison group prevented an examination of whether the prevalence of health outcomes in this study differ from those in the general population. Future studies could address this limitation by including a normative control group.

From Crime Prevention to Health Promotion

Two decades ago, Tolan and Dodge (2005) made a compelling argument for recognizing antisocial behavior as a legitimate healthcare concern. More than a decade later, Burt and colleagues (2018) recharacterized this concern as a crisis, advocating for swift reorganization and reallocation and resources to address the significant individual, familial, and societal burdens associated with conduct disorder. The findings from this study are consistent with this call to action and provide the impetus for greater investments in children's mental health, pediatric health care, and injury prevention initiatives aimed at antisocial children. As the leading cause of death in children, accidents and injuries are important to prevent in their own right. For at-risk children, however, it is important to recognize that they can compound other risk factors for antisocial behaviour, for example, causing school absences that hinder academic achievement (Boyce, King, & Roche, 2008). It must also be stressed that the negative outcomes of conduct disorder extend beyond physical health problems to include mental illness later in life. This study showed that boys who experienced trauma, abuse or neglect were more likely to access care for a mood and anxiety disorder. Considering that many of these abused kids will end up in child welfare systems that are typically unprepared to meet their needs (Herz, Harada, Lecklitner, Rausao, & Ryan, 2009), it becomes clear that a systems-wide approach (see Kazak et al., 2010) is needed not only steer them away from a life of crime, but also to promote their overall health and well-being.

Conclusions

If a common societal goal is to "save children from a life of crime," why would we not also want to save these same children from a life of disease, mental illness, and the long list of other negative life events that are implicated with an antisocial lifestyle? Historically, the EARL-20B has been used by clinicians working with children to assess their "antisocial potential" – the central construct in David Farrington's Integrated Cognitive Antisocial Potential (ICAP) theory of crime (Farrington, 2008) that inspired the development of the EARL-20B. Study findings provide strong empirical support for expanding the community of EARL-20B users to include professionals specializing in injury prevention and health promotion. This presents a promising opportunity for multi-sectoral collaboration to redefine crime prevention policy, prioritizing positive health and mental health outcomes as essential measures of success for antisocial children and their families. While there is still much work to be done, this study provides some direction of how research, practice and policy can move forward in pursuit of this goal.

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Table 1
Items in the Early Assessment Risk List Items for Boys (EARL-20B)

Item/domain/Label		Representative content
FAMILY		
F1	Household circumstances	Poor living conditions, poverty, financial hardship
F2	Caregiver continuity	Unstable caregiver relationships, out of home placements
F3	Family supports	Lack of positive familial supports, family isolation
F4	Family stressors	Marital conflict, mental illness in the family, job loss
F5	Parenting style	Lack of supervision, harsh or overly permissive parenting
F6	Family antisocial values and conduct	Caregiver or sibling criminality, antisocial values
CHILD		
C1	Developmental problems	Fetal alcohol syndrome, learning disabilities
C2	Onset of behavioral difficulties	Behavioral problems starting at an early age
C3	Abuse/neglect/trauma	Physical, sexual, emotional abuse or neglect
C4	Hyperactivity/impulsivity/attention deficits (HIA)	Symptoms or diagnosis of ADHD, and/or impulsivity
C5	Likeability	Unattractive physical appearance, poor social skills
C6	Peer socialization	Age-inappropriate friends, deviant peers, social exclusion
C7	Academic performance	Markedly behind grade level in core subjects
C8	Structured community activities	Not engaged in organized community activities
C9	Police contact	Previous contact with police or other authority figures
C10	Antisocial attitudes	Attitudes in favor of rule breaking, lack of empathy
C11	Antisocial behavior	Severe, frequent, or pervasive rule-breaking behaviour
C12	Coping ability	Inability to cope, anxiety, depression or withdrawal
RESPONSIVITY		
R1	Family responsivity	Parental denial of a problem, lack of engagement
R2	Child responsivity	Uncooperative child, unwillingness to engage in treatment

Note: ADHD = attention deficit hyperactivity disorder.

Table 2
EARL-20B Risk Groups

Total Score Statistic	EARL-20B Risk Group			
	Low	Moderate	High	TOTAL
Range	0-17	18-23	24-40	0-40
Mean	14.12	20.44	27.43	20.98
(SD)	*(2.92)*	*(1.67)*	*(3.18)*	*(6.15)*
N	75	73	86	234

Table 3
The Relationship between the EARL 20B Total Score and Health Service Frequency by Type

SERVICE TYPE/VARIABLE	*N*	EARL-20B Risk Group						ANOVA	
		Low		Moderate		High			
		mean	(*SD*)	*mean*	(*SD*)	*mean*	(*SD*)	*F*-value	*df*
Emergency Room (OHIP)	**189**	**[a]3.85**	**(2.97)**	**5.45**	**(5.01)**	**[a]5.66**	**(4.86)**	***3.97**	**2,186**
Outpatient (OHIP)	234	50.60	(50.51)	54.00	(44.30)	62.95	(66.92)	1.10	2,231
Total OHIP	234	88.38	(73.43)	94.23	(92.27)	100.69	(85.28)	0.53	2,231
Inpatient Admissions	59	1.52	(1.21)	1.50	(0.78)	1.59	(0.85)	0.14	2,56
Length of Inpatient Stay (days)	59	5.31	(5.66)	5.55	(6.58)	6.36	(12.87)	0.06	2,56

NOTES: **P*<.05. Tests were performed on log-transformed values; raw means and standard deviations are shown in the table. Superscripts denote statistically significant groups based on post-hoc (Scheffé) tests; OHIP = Ontario Health Insurance Plan.

Table 4
EARL-20B Item Predictors of Prevalence and Frequency of ER Encounters

EARL-20B ITEM			Prevalence	Frequency
F1.	Household Circumstances		-.024	.041
F2.	Caregiver Continuity		.008	.111
F3.	Supports		-.117†	-.019
F4.	Stressors		-.012	.023
F5.	Parenting Style		-.011	-.027
F6.	Antisocial Values & Conduct		.031	.110
C1.	Developmental Problems		.013	-.130†
C2.	Onset of Behavioural Difficulties		.075	.168*
C3.	Abuse/Neglect/Trauma		.095	.076
C4.	Hyperactivity/impulsivity/attention deficits (HIA)		.267*	.176*
C5.	Likeability		-.005	-.011
C6.	Peer Socialization		.041	.111
C7.	Academic Performance		.025	.068
C8.	Structured Community Activities		-.240*	.042
C9.	Police Contact		.118†	.161*
C10.	Antisocial Attitudes		.060	.132†
C11.	Antisocial Behaviour		.108	.188*
C12.	Coping Ability		.050	.066
R1.	Family Responsivity		-.060	.021
R2.	Child Responsivity		.191*	.144*
Model		number of individuals	234	189
		# items entered	5	7
		SIGNIFICANT PREDICTORS Prevalence: (odds ratio, 95% CI) Frequency: (parameter estimate *Beta*)	***C4 (3.55, 1.82-6.91) ***C8 (0.32, 0.19-0.55) *R2 (2.28, 1.20-4.33) *C9 (1.57, 1.01-2.46)	**C2 (+.109) *C11 (+.105) *C1 (-.085)
		Model	χ^2[4] = 47.32***	*F*[3,185] = 5.90***

*****P < .001; **P<.01; *P<.05; †P<.10 (two-tailed).**

Table 5
The Prevalence of Disease by ICD-9 and Categorical Risk Group (column %)

ICD 9 Disease Categories	EARL-20B RISK GROUP			
	Low (N=75)	Mod (N=73)	High (N=86)	TOTAL (N=234)
1. Infectious and parasitic diseases (a)	85.3	84.9	81.4	83.7
2. Neoplasms	10.7	8.2	10.5	9.8
3. Endocrine, nutritional, metabolic, immunity (a)	17.3	23.9	18.6	19.7
4. Blood and blood forming organs	6.7	15.1	11.6	11.1
5. Mental and behavioral disorders (a, b)	**69.3**	**82.1**	**88.4**	80.3
6. Nervous system, eye, adnexa, ear, mastoid (a)	72.0	64.4	74.4	70.5
7. Circulatory system (a)	37.3	53.4	44.2	44.8
8. Respiratory system (a, b)	90.7	94.5	97.7	94.4
9. Digestive system (a, b)	61.3	64.4	55.8	60.3
10. Genitourinary system (a)	26.7	26.0	44.2	32.9
11. Pregnancy, childbirth and the puerperium				
12. Skin and subcutaneous tissue (a)	77.3	76.7	81.4	78.6
13. Musculoskeletal system and connective tissue (a, b)	73.3	64.4	70.9	69.7
14. Congenital, deformations, abnormalities	9.3	2.7	3.5	5.1
15. Certain conditions in the perinatal period				
16. Injury, poisoning, accidents, diseases of external origin (a, b)	89.3	93.2	89.5	90.6
17. Ill defined conditions	74.7	72.6	79.1	75.6
18. Missing diagnosis	20.0	19.2	29.1	23.1

Notes: Disease categories with sufficient cases to test the statistical relationship between EARL-20B risk and frequency are noted for outpatient (a) and ER (b) service use; bolded numbers denote statistically significant between-group differences.

Table 6
Prevalence of Mental Diagnoses by EARL-20B Risk Status (*N*=234)

Mental Health Disorder/Diagnosis	EARL-20B RISK GROUP				Continuous EARL 20B			
	Low (N=75)	Mod (N=73)	High (N=86)	χ^2[2]	B	SE(B)	χ^2[1]	SE
Substance Use	16.0%	16.4%	22.1%	1.26	.030	.027	1.86	.052
Psychotic	6.7%	6.8%	6.9%	0.01	.006	.042	0.02	.079
Personality	18.7%	15.1%	15.1%	0.48	.002	.028	0.01	.054
Mood/Anxiety	53.3%	68.5%	75.6%	9.11*	.063	.024	7.05**	.039
Childhood & Adolescence	34.7%	46.6%	60.5%	10.76**	.067	.023	8.96**	.036

NOTES: ***P < .001; **P<.01; *P<.05.

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Articoli generali

Behind the psychopathic illusion of «health invulnerability»: assessing psychopathy and health in the Cambridge Study in Delinquent Development (CSDD)

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Abstract

Psychopathy is one of the most studied constructs in criminological and clinical psychology; it is a personality disorder that affects many areas of life and has far-reaching consequences for society and those within it.
The present study analysed data from the Cambridge Study in Delinquent Development (CSDD) by examining the relationship between psychopathy, as measured by the PCL:SV, and physical health, mental health, hospitalisations, disabling medical conditions and premature mortality among CSDD males. These conditions and events were measured using self-report and GP medical records.
The results suggest that psychopathy alone is not the main determinant of poor health outcomes or premature mortality, at least according to self-reported records. The CSDD males who were high on psychopathic traits were also those who engaged in antisocial lifestyles (e.g., heavy drinking, fighting after drinking, smoking, sexual promiscuity), which is not per se a sign of poor health; on the contrary, it may be a sign of physical strength and energy in adolescence and early adulthood.
Some interesting differences emerged between self-reported and GP-reported mental health: the CSDD males were less likely to report their problematic mental health conditions compared to the more accurate GP reports.
Due to the various forms of impairment that psychopathy can cause in a person's life and in society, further research into psychopathy in community samples is certainly needed.

Keywords: Psychopathic traits, mental physical health, mortality, PCL:SV, CSDD

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This work is dedicated to our mentor, Professor David P. Farrington, who has guided us through many important professional and academic decisions. David was particularly interested in researching and assessing the effects of psychopathy on health and always supported any work that linked psychopathy to risk assessment. Sadly, he passed away while we were working with him on this project. We have completed this work to honour his memory and his outstanding achievements in psychological and criminological science.

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Behind the psychopathic illusion of «health invulnerability»: assessing psychopathy and health in the Cambridge Study in Delinquent Development (CSDD)

The Psychopathic Life

Psychopathy is one of the most misunderstood constructs in psychology and psychiatry. Psychopathy was conceptualised as a mental disorder in the past (Kraepelin, 1904; Maudsley, 1874; Prichard, 1835), and in contemporary clinical literature is seen as a personality disorder (Hare, 2003). However, psychopathy is still not explicitly included in the DSM-5 (American Psychiatric Association, 2013) (see Zara & Farrington, 2016, p. 239) and in the DSM-5-TR (2022), and any reference to psychopathy by antisocial personality disorder (Strickland et al., 2013) limits our understanding of the specific nature and essence of psychopathy by considering only the behavioural side of psychopathy (De Fazio, et al., 2016; Di Tella et al., 2024; Ogloff, 2006; Stanga et al., 2022).

According to Hare (2001), if one were to describe the world through the psychopathic lens, human beings would be divided into «givers and takers» (p. 11), with people high on psychopathic traits being «natural born takers» (Hare, 2001, p. 11). Empirical evidence suggests that self-grandiosity and a sense of omnipotence are key features in the maintenance of self-indulgence and self-entitlement in individuals high in psychopathic traits (Klipfel et al., 2017), such that anything is seen as possible and available for them.

Psychopathic individuals are usually able to identify victims to exploit and typically benefit from the co-operation of others without incurring significant costs (Book et al., 2021). What Reidy and colleagues (2015, p. 4) emphasise is that «psychopaths are dangerous in part because they are hybrid beings. They frequently make a positive first impression on others, rendering them adept at deception, manipulation, and outright physical aggression».

Since psychopathy is recognised as consisting of both personality (F1-Psychopathic Personality; F1-PP) and behaviour (F2-Psychopathic Behaviour; F2-PB) factors (Hare, 2003), the likelihood of a life unsuccess is not surprising. F1-PP consists of traits and symptoms related to the interpersonal and affective nature of psychopathy, such as being manipulative, emotionally detached, conning, and deceitful, while F2-PB includes the behavioural characteristics of the disorder, including impulsivity and antisocial behaviour.

People high on psychopathic traits compromise family relationships (Zara et al., 2024), are sexually and emotionally promiscuous (Benfante et al., 2024; Zara et al., 2021), are risk-takers (Snowden et al., 2017), live a parasitic lifestyle (Hare, 1996), endanger work security (Stewart et al., 2022), and carry out antisocial lives (DeLisi, 2016): all these features lead to malevolent and socially malicious behaviours (Di Tella et al., 2024; Paulhus & Williams, 2002).

There is evidence in the literature that such lifestyles and behaviours are detrimental to health (e.g., Skinner & Farrington, 2020). When health is impaired, the façade of grandiosity, that psychopaths in particular cultivate is jeopardised: when health is poor, the perception of the self as invincible crumbles.

In line with the available literature on this topic (e.g., Jonason et al., 2015; Mededovic & Kujacic, 2020), we agree that such effects should be understood within the framework of evolutionary psychology and suggest that a 'fast life-history strategy' manifested in short-term mating propensity, high impulsivity, decreased self-control, selfishness, and other manifestations of a generally antisocial lifestyle, may lead to poor health outcomes in the long term (Jonason et al., 2010, 2015; Sýkorová & Flegr, 2021). Such a strategy has been shown to successfully explain psychopathic traits and their correlates both theoretically and empirically (Horsten et al., 2022; Hurst & Kavanagh, 2017; Jonason et al, 2010; Lu & Chang, 2019; Zara et al, 2021). This evolutionary strategy is likely a response to, and is reinforced by, the expectation of poor health outcomes and early death (Nettle, 2010).

Psychopathy and Health Outcomes

Skinner and Farrington (2021) investigated how an antisocial personality would impact physical and psychological health. Their study used longitudinal data from the Cambridge Study in Delinquent Development (CSDD) (see the methodology section for details). Antisocial personality was explored in relation to physical and mental illnesses, disabling medical conditions and whether the person had ever been hospitalised. These conditions and events were measured both as self-reported medical history as well as through General Practitioner (GP) reported medical records. The results differed according to whether the medical history was measured using self-report or GP records. The only significant relationships between antisocial personality and self-reported medical history were whether they had ever been hospitalised ($p = 0.01$). For GP records on the other hand, there were more significant associations between antisocial personality and health outcomes, where antisocial personality was related to physical and mental illness as well as experiencing a disabling medical condition. Interestingly, for GP records, there was no significant relationship between antisocial personality and

hospitalisation. These results show the importance of measuring health outcomes using multiple methods, and also investigating whether other personality disorders can have similar effects and consequences.

The study of psychopathy was particularly important for research into its effects on health. Beaver et al. (2014) carried out a relevant study to specifically examine the relationship between psychopathic personality and health outcomes by analysing data from the Add Health Study. Logistic regressions controlling for relevant variables (e.g., imprisonment) found that psychopathic personality was significantly and positively related to a wide range of physical (e.g., diabetes, high blood pressure, high cholesterol, and migraines) and mental health (i.e., ADD/ADHD, anxiety, and depression) problems and issues.

Mededovic and Kujacic (2020) used a Serbian prison sample (n = 224) to test how the heterogenous construct of psychopathy would be associated with physical and/or mental health problems. Psychopathy was measured using the Hare Psychopathy Checklist - Revised (2003), which is a clear strength compared to earlier studies (Mededovic & Kujacic, 2020). Point-biserial correlation analyses showed that interpersonal traits were *negatively* related to physical health problems, but lifestyle and antisocial traits were *positively* related to physical health problems. Pearson correlation analysis showed that for mental health problems, it was only lifestyle and antisocial traits that were significantly and positively associated.

The differential relationships with health outcomes are also consistent with recent research on health behaviour (Debska et al., 2021). Debska et al. (2021) found in a Polish student sample that scores on the Boldness scale of the Triarchic Psychopathy Assessment were significantly and positively associated with scores on the Positive Mental Attitude Scale, while scores on the Disinhibition Scale were significantly and negatively associated with scores on the Health Behaviour Inventory and the Positive Mental Attitude Scale (Debska et al., 2021). The latter findings are perhaps not surprising, as it is generally recognised that mental health problems are likely to have a negative impact on physical health (Butler et al., 2020; Ohrnberger et al., 2017).

There are not many peer-reviewed papers on how psychopathy is related to mortality, but Jonason et al. (2015) conducted three related studies across three countries (USA, Australia, and the UK) on the relationship between dark triad personality traits and health, and their findings suggested that psychopathy is related to early death. Of most interest to the current paper are the results pertaining to psychopathy. Across the three studies, psychopathy was consistently related to poor outcomes. For example, psychopathy was significantly positively related to depression, anxious and avoidant attachment, and smoking and alcohol consumption. On the other hand, psychopathy was significantly and negatively related to physical health, emotional and psychological well-being, sunscreen use, and life expectancy (Jonason et al.2015). According to a recent study by Maurer et al. (2025), not all antisocial behaviours are equal when it comes to predicting long-term health outcomes. It appears that psychopathic traits in young people have a unique predictive power when it comes to premature mortality. The researchers observed that 33 of the total 332 participants died during a follow-up period (between 10 and 14 years): This corresponds to an observed premature mortality rate of 9.94%, which is significantly higher than the expected mortality rate for individuals of a comparable age (Maurer et al., 2025). In other words, the adolescents with the highest total PCL:YV scores had a higher premature mortality rate compared to the adolescents with low total PCL:YV scores (Forth et al. 2003).

Vaurio et al. (2018) carried out one of few studies on psychopathy and mortality; subsequently these researchers explored female psychopathy and mortality (Vaurio et al., 2019). They found that in a Finnish forensic context, being high on psychopathic traits (Hare Psychopathy Checklist-Revised score of 25 or above) significantly increased the risk of death compared to those who scored lower on psychopathic traits (PCL-R score below 25).

Interestingly, however, the study also found that a stay in a forensic institution increased mortality compared to a matched comparison group drawn from the male Finnish population.

In terms of causes of death, a high psychopathy group was more likely to die from "unnatural causes" (28%) compared to the low psychopathy group (17.42 %), and the trend was reversed for "natural causes" (high psychopathy = 15% versus low psychopathy = 23.03%). When rank ordering causes of deaths for the two groups, there were some differences between the groups. Those scoring 25 or above on the PCL-R were most likely to die from the following conditions/circumstances (in descending order): (1) intoxication (18.18 %), (2) lung disease or 'other accident' (both 13.64 %), (3) suicide or homicide (both 11.36%). Those scoring below 25 on the PCL-R were most likely to die of the following (in descending order): (1) cardiovascular disease (27.40%); (2) cancer, suicide, and intoxication (all 15.07%); (3) 'other disease' or 'other accident' (both 5.48%). In addition to informing about the mortality of those who score high on psychopathy, this study also provides valuable information about their health status. The main groups in the study (the high versus low psychopathy groups) were however drawn from a forensic (criminal) population. As highlighted by Skinner and Farrington (2020), such samples might not be representative of, nor generalisable to, a community population.

The Current Study

The emerging literature suggests that there are health costs associated with psychopathic traits (Beaver et al., 2014). Gatner et al. (2022) specifically examined the economic burden of psychopathic disorders in North America using a top-down approach to the cost of illness based on preva-

lence (Chapko et al., 2009). Their analysis showed that the costs of crime directly associated with psychopathy were significantly high, as expected; however, the high costs were also indirect, as psychopathy likely offsets other potential costs related to health care, job productivity, the justice system, and social welfare.

More specifically, those high on psychopathy are likely to live lives that are most often, than not, on the edge and 'fast paced', which could be an attempt to react to environmental and social challenges rather than being overwhelmed by them. The available empirical research appears to be in line with this theoretical framework, where psychopathic traits are associated with poor health outcomes, life unsuccess, and early death (e.g., Jonason et al., 2015; Vaurio et al. 2018; Zara et al., 2024). There is however an overall lack of research in this area, and there are some limitations in the past studies. For example, Beaver et al. (2014) used a specific scale of psychopathy that was developed for their data set, and while other studies have used thoroughly validated measures of psychopathy, these studies tend to use forensic samples (Mededovic & Kujacic, 2020). There is a research gap on psychopathy and health outcomes and mortality in a community setting. The aim of this study is therefore to answer the following research questions, based on the specific hypotheses listed below:

1. How are psychopathic traits related to physical health?
   - It is expected that psychopathy will be associated with poor physical health outcomes (e.g., Horsten et al., 2022; Jonason et al., 2010, 2015).
   - It is expected that F2-PB will be more strongly related to poor physical health outcomes than F1-PP based on past research by Mededovic and Kujajic (2020).
   - On a more exploratory basis, it is suggested that due to impression management (e.g., Hart et al., 2019) as well as past research (e.g., Skinner & Farrington, 2021), it is likely that there will be more significant relationships between psychopathy and GP recorded medical history versus psychopathy and self-reported history.
2. How are psychopathic traits related to poor mental health?
   - Because of past research on unsuccess in life (Jonason et al., 2010, 2015; Zara et al., 2024), it is expected that those higher on psychopathic traits will have comorbid mental health problems.
3. How are psychopathic traits related to mortality?
   - It is expected that psychopathy will be related to early death (e.g., Maurer et al., 2025)
   - It is expected that F2-PB will be associated with early mortality because of the previously found association between antisociality and premature death (e.g., Skinner & Farrington, 2020; Skinner et al., 2022).

CSDD Sample

The current investigation analyses data from the CSDD. As described elsewhere (e.g., Farrington, 2019), the CSDD is a prospective longitudinal study of delinquent and criminal behaviour in a community sample of 411 South London males that started in the early 1960s. These CSDD males have been followed across the life-course, from age 8 through to age 61 (Farrington 2021; Farrington & Jolliffe, 2022).

The CSDD received ethical approval from the Home Office, Cambridge Institute of Criminology, and the Ethics Committee of the Institute of Psychiatry, King's College London.

Health Data from the CSDD

GP Reported Health Data

At age 48, 304 men completed a medical interview for the research (89% of the 343 who had the core face to face social interview) and each was asked for consent for us to obtain their medical records from their GPs. Data were requested from every GP surgery where an individual had been registered, and full primary care data (paper records) from birth up to age 48 were returned for 264 men, 87% of those who completed the medical interview but only 77% of those with a social interview. As in previous research (Skinner & Farrington, 2021), the GP data were then coded into binary (Yes/No) variables. Physical illness categories were respiratory tract, cardiovascular, musculoskeletal, skin, allergic, gastro-intestinal and infectious illnesses. Severity was in part indicated by disabling medical conditions (any chronic disabling illness whether psychiatric or medical). Mental illness was indicated by psychological episodes and psychiatric inpatient admissions. Service use was indicated by outpatient admission for mental health problems, ever hospitalised as a medical inpatient, and surgical admissions.

Self-Reported Health Data

In social interviews, self reports of all illnesses that had occurred at ages 16–18, 27–32 and 43–48 were collected. Illnesses were coded into the same health categories as described above for the GP records, except for outpatient admission for mental health problems and surgical admissions, which were not asked about because of shortage of time in a wide ranging interview (Skinner et al., 2020). There were two separate hospitalisation variables: the number of hospital visits mentioned within social interviews conducted at ages 32 and 48, and a second ever hospitalised variable computed from the aforementioned medical interview. Disabling Medical Condition was also coded based on the following question at interview: 'Have ever been registered disabled under the disabled persons employment act or with a Local Authority or other organisations?'

Premature Mortality

Death records of the CSDD males were collected by Piquero and colleagues (2014), who obtained information about deaths up to 2010, at an average age of 57, from relatives during attempts to interview the CSDD men and their female partners and children. This information was supplemented by searches in the General Register Office, and 31 males were found to have died, at the average age of 42. To supplement and update these findings, Skinner and colleagues (Skinner et al., 2021) sent Freedom of Information Act requests to NHS Digital, asking them to disclose whether their records indicated whether an individual from the CSDD had died. All individuals recorded as deceased according to NHS Digital were then searched within the General Register Office's Death Registry, and death certificates were requested up to 2019. In total, 386 individuals were searched, because they had not emigrated up to the last interview at age 48. If they had not emigrated up to age 48, it was likely that they had not emigrated up to age 65. Premature death is operationalised as deaths up to age 65.

Psychopathy

Psychopathic traits were assessed as part of the in-person interview at age 48 using the Psychopathy Checklist: Screening Version (PCL:SV; Hart et al., 1995), which is the shorter version of the more comprehensive Psychopathy Checklist-Revised (PCL-R; Hare, 2003) and suitable to use with community samples (Hart et al., 1995). It consists of 12 items, each rated on a 3-point ordinal scale (0, 1, and 2) for a total score of 24 (Hart et al., 1995). The PCL:SV measures psychopathy based on two factors, which both have scores from 0 to 12. Factor 1 is a measure of psychopathic personality: F1-PP. Factor 2 is a measure of psychopathic behaviour: F2-PB. Factor 1 is related to the core personality characteristics and is composed of two facets, interpersonal (arrogant, deceitful, manipulative) and affective (deficient affective experience, lack of empathy), while Factor 2 is related to the lifestyle (impulsive, irresponsible) and antisocial (juvenile, adult antisocial behaviour) facets.

For this study, it was decided to analyse total psychopathy, Factor 1 (Psychopathic Personality) and Factor 2 (Psychopathic Behaviour) scores both as continuous variables and as dichotomised scores in light of previous studies (Farrington & Bergstrøm, 2018; Zara & Farrington, 2016; Zara et al., 2024). We also analysed, as continuous variables, the specific facets of Factor 1 (Interpersonal Facet 1, Affective Facet 2) and Factor 2 (Lifestyle Facet 3, Antisocial Facet 4).

Analytical Strategy

Continuous Data Analyses

Independent samples t-tests were conducted where psychopathy (total, F1, F2, Interpersonal Facet 1, Affective Facet 2, Lifestyle Facet 3, Antisocial Facet 4) are treated like continuous variables. Negative t-values indicate worse physical and mental health, and a greater likelihood of having been hospitalised and having a disabling medical condition.

Dichotomous Data Analysis

Odds Ratios were calculated using thresholds of 10 or more for high PCL:SV, F1-PP was 3+ and F2-PD was 5+. ORs above one indicate worse physical and mental health, and a greater likelihood of having been hospitalised and having a disabling medical condition.

Results

Continuous Analysis Results

Means, standard deviations, skewness, and internal consistency across the four facets, two factors and total scores of the PCL:SV in this sample are shown in Table 1.

Table 1. Means, Standard Deviations, Skewness, and Kurtosis of All Four Facet Scores, Factor 1, Factor 2 and Total PCL:SV in the CSDD Sample.

	F1-PP Score	F2-PB Score	Total PCL:SV Score	Interpersonal Facet 1 Score	Affective Facet 2 Score	Lifestyle Facet 3 Score	Antisocial Facet 4 Score
Mean	1.1612	2.3092	3.4704	.51	.65	.61	1.70
Standard Deviation	1.57654	2.60675	3.82873	.840	1.036	1.053	1.813
Skewness	1.538	1.300	1.374	1.823	1.695	1.988	.865
Kurtosis	2.013	.925	1.202	3.362	2.342	3.743	-.421

Note: n = 304. Reliability as measured by Cronbach's alpha = 0.77 across all four facets; F1-PP (Factor 1: psychopathic personality) = 0.75; F2-PB (Factor 2: psychopathic behaviour) = 0.94. PCL:SV = Psychopathy Checklist: Screening Version; CSDD = Cambridge Study in Delinquent Development.

Self-Reported Lifetime Health in the CSDD males

Table 2 reports the results of self-reported lifetime health based on independent samples t-tests where psychopathy (total, F1, F2, Interpersonal Facet 1, Affective Facet, Lifestyle Facet 3, Antisocial Facet 4) are treated as continuous variables. There were significant associations between total PCL:SV and self-reported hospitalisation and having a disabling medical condition. F1-PP was significantly associated with higher levels of self-reported hospitalisation. F2-PB was significantly associated with higher levels of self-reported disabling medical conditions. Affective Facet 2 was significantly associated with disabling medical conditions. Lifestyle Facet 3 was significantly associated with poorer physical and mental health, in addition to being more likely to having been hospitalised and having a disabling medical condition. Antisocial Facet 4 was significantly associated with having a disabling medical condition.

Table 2. Continuous Analysis: Self-Reported Lifetime Health in the CSDD Males

Psychopathy	Physical Health	Mental Health	Ever Hospitalised	Disabling Medical Condition
Total PCL:SV	t(302) = -1.180, *p* = 0.075 *n* = 304	t(302) = 0.368, *p* = 0.297 *n* = 304	t(296) = -1.980, *p* = 0.027* *n* = 298	t(302) = -3.073, *p* = 0.008** *n* = 304
F1-PP	t(302) = -0.554, *p* = 0.514 *n* = 304	t(302) = 0.268, *p* = 0.444 *n* = 304	t(296) = -1.089, *p* = 0.039* *n* = 298	t(302) = -2.404, *p* = 0.131 *n* = 304
F2-PB	t(302) = -1.399, *p* = 0.063 *n* = 304	t(302) = 0.378, *p* = 0.304 *n* = 304	t(296) = -2.246, *p* = 0.075 *n* = 298	t(302) = -3.051, *p* = 0.007** *n* = 304
Interpersonal Facet 1	t(302) = -0.171, *p* = 0.597 *n* = 304	t(302) = 0.206, *p* = 0.816 *n* = 304	t(296) = -0.450, *p* = 0.368 *n* = 298	t(302) = 0.711, *p* = 0.208 *n* = 304
Affective Facet 2	t(302) = -0.704, *p* = 0.168 *n* = 304	t(302) = 0.242, *p* = 0.392 *n* = 304	t(296) = -1.290, *p* = 0.087 *n* = 298	t(302) = -4.327, *p* = <0.001*** *n* = 304
Lifestyle Facet 3	t(302) = -1.773, *p* = 0.010** *n* = 304	t(302) = 1.050, *p* = 0.044* *n* = 304	t(296) = -2.351, *p* = 0.006** n = 298	t(302) = -2.739, *p* = <0.001*** *n* = 304
Antisocial Facet 4	t(302) = -0.981, *p* = 0.316 *n* = 304	t(302) = -0.065, *p* = 0.462 *n* = 304	t(296) = -1.856, *p* = 0.749 *n* = 298	t(302) = -2.783, *p* = 0.050* *n* = 304

Note: PCL:SV = Psychopathy Checklist: Screening Version; CSDD = Cambridge Study in Delinquent Development. F1-PP (Factor 1: psychopathic personality); F2-PB (Factor 2: psychopathic behaviour).

GP-Reported Lifetime Health

Table 3 reports the results of GP-reported lifetime health in the CSDD males based on independent samples t-test, where psychopathy (total, F1, F2, Interpersonal Facet 1, Affective Facet, Lifestyle Facet 3, Antisocial Facet 4) are treated as continuous variables. Total PCL:SV was significantly associated with greater GP-reported hospitalisations and disabling medical conditions. Similarly, F1-PP and F2-PB were also associated with greater GP-reported hospitalisations and disabling medical conditions. Interpersonal Facet 1, Affective Facet 2, Lifestyle Facet 3 and Antisocial Facet 4 were all significantly associated with poorer mental health. Affective Facet 2, Lifestyle Facet 3 and Antisocial Facet 4 were also significantly associated with being more likely to have a disabling medical condition.

Table 3. Continuous Analysis: GP-Reported Lifetime Health

Psychopathy	Physical Health	Mental Health	Ever Hospitalised	Disabling Medical Condition
Total PCL:SV	t(261) = -0.919, *p* = 0.252 *n* = 263	t(261) = -3.945, *p* = <0.001*** *n* = 263	t(261) = -0.615, *p* = 0.131 *n* = 263	t(261) = -2.316, *p* = <0.001*** *n* = 263
F1-PP	t(261) = -0.883, *p* = 0.268 *n* = 263	t(261) = -3.645, *p* = <0.001*** *n* = 263	t(261) = -0.295, *p* = 0.770 *n* = 263	t(261) = -2.285, *p* = 0.004** *n* = 263
F2-PB	t(261) = -0.798, *p* = 0.244 *n* = 263	t(261) = -3.483, *p* = <0.001*** *n* = 263	t(261) = -0.709, *p* = 0.218 *n* = 263	t(261) = -1.972, *p* = <0.001*** *n* = 263
Interpersonal Facet 1	t(261) = -0.304 *p* = 0.562 *n* = 263	t(261) = -1.899 *p* = 0.001*** *n* = 263	t(261) = 0.443 *p* = 0.944 *n* = 263	t(261) = -1.259 *p* = 0.122 *n* = 263
Affective Facet 2	t(261) = -1.051 *p* = 0.297 *n* = 263	t(261) = -3.838 *p* = <0.001*** *n* = 263	t(261) = -0.767 *p* = 0.198 *n* = 263	t(261) = -2.359 *p* = <0.001*** *n* = 263
Lifestyle Facet 3	t(261) = -0.558 *p* = 0.141 *n* = 263	t(261) = -3.453 *p* = <0.001*** *n* = 263	t(261) = -0.701 *p* = 0.201 *n* = 263	t(261) = -1.726 *p* = <0.001*** *n* = 263
Antisocial Facet 4	t(261) = -0.811 *p* = 0.359 *n* = 263	t(261) = -2.965 *p* = 0.008** *n* = 263	t(261) = -0.609 *p* = 0.199 *n* = 263	t(261) = -1.811 *p* = 0.011** *n* = 263

*Note:*PCL:SV = Psychopathy Checklist: Screening Version.
F1-PP (Factor 1: psychopathic personality); F2-PB (Factor 2: psychopathic behaviour).

Premature mortality in the CSDD males

Table 4 reports the results of premature mortality in the CSDD males based on independent samples t-tests, where psychopathy (total, F1, F2, Interpersonal Facet 1, Affective Facet, Lifestyle Facet 3, Antisocial Facet 4) are treated as continuous variables. There were no significant associations between Total PCL:SV, F1-PP or F2-PB and premature mortality. Affective Facet 2 and Lifestyle Facet 3 were significantly associated with premature mortality.

Table 4. Continuous Analysis: Premature Mortality

Psychopathy	Premature Mortality
Total PCL:SV	t(295) = -1.660, *p* = 0.098 *n* = 297
F1-PP	t(295) = -0.843, *p* = 0.400 *n* = 297
F2-PB	t(295) = -1.918, *p* = 0.056 *n* = 297
Interpersonal Facet 1	t(295) = 0.727, *p* = 0.244 *n* = 297
Affective Facet 2	t(295) = -1.889, *p* = <0.001*** *n* = 297
Lifestyle Facet 3	t(295) = -2.594, *p* = 0.006** *n* = 297
Antisocial Facet 4	t(295) = -1.264, *p* = 0.051 *n* = 297

*Note:*PCL:SV = Psychopathy Checklist: Screening Version.
F1-PP (Factor 1: psychopathic personality); F2-PB (Factor 2: psychopathic behaviour).

Dichotomous Analysis Results

In all the following dichotomous analyses, Odds Ratios were calculated using thresholds of 10 or more for high PCL:SV, 3 or more for F1-PP, and 5 or more for F2-PD. Descriptively, 24 individuals scored high on PCL:SV, 42 for F1-PP, and 40 for F2-PD.

Self-Reported Lifetime Health

Table 5 reports the results of self-reported lifetime health in the CSDD males based on Odds Ratios. Total PCL:SV, F1-PP and F2-PB were also significantly associated with greater self-reported levels of disabling medical conditions.

Table 5. Dichotomous Analysis: Self-Reported Lifetime Health

Psychopathy	Physical Health	Mental Health	Ever Hospitalised	Disabling Medical Condition
Total PCL:SV	OR = 1.885 (0.749-4.740) *n* = 304	OR = 0.696 (0.156-3.094) *n* = 304	OR = 1.774 (0.791-3.982) *n* = 298	OR = 5.198** (1.629-16.592) *n* = 304
F1-PP	OR = 1.064 (0.553-2.046) *n* = 304	OR = 0.852 (0.280-2.588) *n* = 304	OR = 1.485 (0.791-2.790) *n* = 298	OR = 3.689* (1.225-11.106) *n* = 304
F2-PB	OR = 1.814 (0.865-3.802) *n* = 304	OR = 0.640 (0.184-2.223) *n* = 304	OR = 1.384 (0.733-2.611) *n* = 298	OR = 3.978* (1.318-12.004) *n* = 304

Note:PCL:SV = Psychopathy Checklist: Screening Version.
F1-PP (Factor 1: psychopathic personality); F2-PB (Factor 2: psychopathic behaviour).
*p =/< 0.05; **p =/< 0.01; ***p =/< 0.001

GP-Reported Lifetime Health

Table 6 reports the results of GP-reported lifetime health based on Odds Ratios. Total PCL:SV, F1-PP and F2-PB were all significantly associated with higher GP-reported mental health issues and disabling medical conditions.

Premature Mortality in the CSDD males

Table 7 reports the results of the CSDD males premature mortality based on Odds Ratios. There were no significant relationships between psychopathy and premature mortality.

Table 6. Dichotomous GP-reported Lifetime Health

Psychopathy	Physical Health	Mental Health	Ever Hospitalised	Disabling Medical Condition
Total PCL:SV	OR = 1.100 (0.462-2.614) *n* = 263	OR = 3.494** (1.437-8.497) *n* = 263	OR = 1.460 (0.326-6.544) *n* = 263	OR = 2.970* (1.258-7.010) *n* = 263
F1-PP	OR = 1.562 (0.770-3.166) *n* = 263	OR = 3.039*** (1.537-6.007) *n* = 263	OR = 1.809 (0.523-6.261) *n* = 263	OR = 2.218* (1.101-4.467) *n* = 263
F2-PB	OR = 1.257 (0.622-2.537) *n* = 263	OR = 2.418* (1.220-4.793) *n* = 263	OR = 1.699 (0.490-5.891) *n* = 263	OR = 2.431* (1.197-4.937) *n* = 263

*Note:*PCL:SV = Psychopathy Checklist: Screening Version.
F1-PP (Factor 1: psychopathic personality); F2-PB (Factor 2: psychopathic behaviour).
*p =/< 0.05; **p =/< 0.01; ***p =/< 0.001

Table 7. Dichotomous Premature Mortality

Psychopathy	Premature Mortality
Total PCL:SV	OR = 3.060 (0.782-11.964)
F1-PP	OR = 1.605 (0.419-6.146)
F2-PB	OR = 2.598 (0.751-8.986)

Note: PCL:SV = Psychopathy Checklist: Screening Version. F1-PP (Factor 1: psychopathic personality); F2-PB (Factor 2: psychopathic behaviour).
*p =/< 0.05; **p =/< 0.01; ***p =/< 0.001

Discussion

Psychopathy and Health Outcomes

This study investigated the relationship between psychopathy, measured by PCL:SV, and physical health, mental health, hospitalisations, disabling medical conditions and premature mortality in the CSDD males. Assessing these aspects is crucial for understanding the impact of psychopathy on the functioning of daily life beyond social and antisocial behaviour.

Interestingly, despite theoretical grounding (e.g., Beaver et al., 2014; Reidy & Bogen, 2022; Vaurio et al., 2018, 2022), the findings in the current analyses suggest that no significant associations were found between psychopathic traits, as measured with PCL:SV, and physical health. One interpretation of these results can be that less healthy men were involved in a less antisocial lifestyle because they were unable to engage in risky activities due to their poor health, and this might have had implications for our analyses in relation to psychopathy: Individuals with poor health may be more inclined to restrain themselves, less able to manipulate others and engage in deviant and promiscuous activities. Another interpretation is that there may be differences between the CSDD males who are high in total PCL:SV, F1-PP or F2-PB and those who actually engage in an antisocial lifestyle (e.g., heavy drinking, fighting after drinking, smoking, sexual promiscuity) associated with physical health, as previous research showed (Shepherd et al., 2002, 2009). Paradoxically, these behaviours are not *per se* a sign of poor health; on the contrary, they can even be a sign of physical strength and energy in youth and middle age, as shown in this study, while in the long term they are likely to have the worst effects by weakening physical health.

The findings of this study suggest that psychopathy alone is not the main determinant of poor health outcomes or premature mortality. If we consider previous findings suggesting that antisocial behaviour and offending are associated with poorer health outcomes, it may well be that it is the likelihood of antisocial and violent behaviour that is associated with poor health outcomes rather than high psychopathic traits *per se*. In a sense, psychopathy may instead be a key factor in poor health in people who encounter psychopathic individuals and fall under the spell of their superficial allure, which masks manipulativeness and selfishness. However, further studies should specifically investigate the indirect effects of psychopathy on the health of partners and friends, who are the direct victims.

Despite no significant associations between psychopathy and physical health being identified in our analyses, our results do highlight consistent statistically significant associations between psychopathy and disabling medical conditions. This association was present regardless of whether disabling medical conditions were self-reported or GP-reported, and whether psychopathy was measured continuously and dichotomously as high/low.

Although psychopathy may not be associated with poor physical health across the life-course, one repercussion of psychopathy may be the risk taking and fear aversion associated with these personality profiles. These predispositions may lead to an increased dysregulated lifestyle and risk-taking behaviours, which results in more catastrophic injuries when compared to individuals with lower levels of psychopathy. In particular, the affective component was significantly associated with disabling medical conditions, and lifestyle was significantly associated with poorer physical and mental health. As expected, antisociality was significantly associated with health impairment, as shown in Table 3. This may be one explanation as to why individuals with higher total PCL:SV, P1-PP and P2-PB were associated with significantly higher levels of reported hospitalisations and disabling medical conditions, but not poorer physical health in general.

A possible indirect repercussion of psychopathy lies in the core of it: individual with high psychopathic traits exhibit a sense of self-aggrandising (Cooke et al., 2012; Prosser et al., 2018) which may lead to regarding themselves as invulnerable and untouchable by anything, illnesses included. However, psychopathic individuals in this study reported more hospitalisations and disabling medical conditions. Their increased willingness to take risks and their lack of fear may explain the catastrophic injuries these people suffer, and thus the disabling medical conditions, even if they reject the need for hospitalisation, which is seen as compromising their sense of invulnerability. These reactions are easier in younger years, while they are more difficult to pursue when older.

There were some interesting differences that emerged between self-reported and GP recorded health in line with our expectations and previous research. For example, there were some differences between self-reported and GP-reported mental health. Psychopathy, when measured dichotomously, was not significantly associated with mental health difficulties when self-reported. However, total PCL:SV, F1-PP and F2-PB were all significantly associated with higher levels of mental difficulties according to GP records. The significant association between psychopathy and mental health difficulties is not surprising, considering our expectations and past literature (Skinner & Farrington, 2020), but this was only found for GP reported life-time health.

The GP's reports are likely to be a more accurate description of a person's mental health condition than the description of the lay person suffering from that condition, not least because of the possibility that the mental health difficulties may not be recognised as problematic. Furthermore, it is also important to consider the likelihood that individuals with marked psychopathic traits will deny mental health problems of any kind. Looking more closely at the facets of psychopathy, the results suggest that interpersonal (Facet 1), affective (Facet 2), lifestyle (Facet 3) and antisocial reality (Facet 4) in particular are all significantly associated with poorer mental health, and also significantly associated with a higher likelihood of health impairment (with the exception of the interpersonal facet), according to GPs' reports (see Table 3 for details).

Psychopathy can in fact be associated with low reactivity to stress and punishment cues (Verona et al., 2004), to high anxiety and impulsivity (Skeem et al., 2007), which show the complexity behind the full spectrum of its manifestations (Di Tella et al., 2024; Stanga et al., 2022). Despite the current debate of whether psychopathy should be considered a mental disorder (Wakefield et al., 1992) or a life history strategy of social exploitation (Harpending & Sobus, 1987; Pullman et al., 2021), it is certainly important to look at the consequences psychopathy has for the people themselves, and for society (Reidy & Bogen, 2022). Indeed, «given the morbidity of psychopathy and its negative impact on society, it is difficult to imagine that any mental disorder, save perhaps schizophrenia, could be considered a greater public health concern» (Hart & Hare 1996, p. 131).

It should be noted, however, that non-significant findings are as important to report and understand as statistically significant ones, as they fully elucidate the development and outcomes of the psychopathy construct, and the differences when psychopathy is assessed as a whole disorder or as factors and facets, dichotomously or continuously (also discussed in Zara et al., 2024).

Psychopathy and Mortality

Non-significant findings were also found for psychopathy and mortality. While psychopathic traits are associated with a disabling medical condition, total psychopathy scores did not appear to have an association with early death.

These findings contrast with previously reported findings. However, there are several potential reasons for these differences. First, the previous findings by Vaurio et al. (2018) were based on a forensic sample in Finland, and Vaurio et al. (2018) found that psychopathy was nonlinearly related to early death. This nonlinear relationship, where only the highest scores have been associated with outcomes of interest, has also been found in other studies (e.g., Farrington & Bergstrøm, 2018). Since the current analyses were from the CSDD, which involves a community sample, it might be that the level of psychopathy does not reach the pathological cut-off for this effect. Second, based on Skinner et al. (2022) it could be that it is the incarceration experience to have influenced the effect in other studies (e.g., Vaurio et al., 2018). This explanation is supported by the previously mentioned results on impulsivity by Farrington and Aguilar-Carceles (2023). In the CSDD, the incidence of incarceration was very low, as most of the affected CSDD offenders were sentenced to alternative measures to prison, which may explain the lack of association between psychopathy and early mortality. However, when looking at the affective and lifestyle facets, findings show some significant association with premature mortality (see Table 4 for details).

It is important to bear in mind that the impairments that psychopathy can cause in a person's life can take various forms, which are not necessarily the most alarming, since psychopathic people protect themselves under the spell of the invulnerability and omnipotence attributed to their self. They prefer to deny any weaknesses, even if this could jeopardise their health. This makes psychopathy a controversial, paradoxically self-hostile disorder.

Conclusion, Limitations, and Suggestions for Future Research

The current paper shows that psychopathic traits were linked with hospitalisations and disabling medical conditions but were not significantly associated with poorer physical health in general or early mortality. Some significant results show a significant association between psychopathy and mental health difficulties according to GP records. This is not surprising, as that GP's understanding of the state of mental health is certainly more accurate than a layperson's description, especially if the person has strong psychopathic traits and is influenced by a self-aggrandising spell.

There are some limitations to this study that should be noted. While the CSDD is recognised for its methodological strengths and diversity of data (Farrington & Bergstrøm, 2022; Farrington et al., 2023), the available medical information is limited to GP records or self-reports. Future research should endeavour to obtain complete clinical records of health conditions at different stages of life in order to assess possible serious adverse changes in the quality of physical and mental health. A further limitation is that these results relate to Generation 2 of the CSDD, in which only males participated; it may be interesting to examine the impact of distinct psychopathic traits on physical and mental health in a female community sample.

In light of these findings, further analysis is needed to understand in detail how psychopathic personality (P1-PP) and psychopathic behaviour (P2-PB), as well as the affective, interpersonal, lifestyle and antisocial facets of psychopathy, specifically and differentially influence the quality of health (mental and physical), affect medical

condition and impact on the mortality risk of individuals over their lifetime.

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Articoli generali

Charting pathways to intervention: the cracow risk/needs assessment instrument and professor David P. Farrington's theoretical influence

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Abstract

Professor David P. Farrington had a significant theoretical and policy influence on Professor Raymond Corrado's work, as evidenced in his initial research and scholarly publications. In this article, we focus on discussions surrounding Canada's eventual implementation of the Young Offenders Act in 1984 and the preceding youth justice acts (e.g., JDA), Professor Corrado's subsequent work on serious and violent young offenders, and how this connects back to Professor Farrington's contributions and theoretical influence.

We highlight Farrington's groundbreaking longitudinal cohort studies, including his extensive and unparalleled publications that began with the Cambridge Study in Delinquent Development, as well as the Montreal Longitudinal and Experimental Study and the Dunedin Study. Theoretically, Professor Farrington was among the first scholars to promote developmental psychological and life-course perspectives that challenged the dominant single-construct theories of crime at that time.

His influence on Professor Corrado was pivotal in the creation of the Cracow Risk/Needs Instrument (CI) and related validation studies. Dr. Corrado and colleagues designed the CI tool to help agencies construct individualized case management plans for serious and violent young offenders. Lastly, Professor Farrington's theoretical perspective informed Professor Corrado's "seven pathway models," which emphasize the distinct developmental trajectories that necessitate tailored interventions targeting the central risk/needs factor.

Keywords: Professor David P. Farrington, developmental and life-course criminology.

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Charting pathways to intervention: the cracow risk/needs assessment instrument and professor David P. Farrington's theoretical influence

I first met Professor David P. Farrington in 1981 in Ottawa, Canada, where we were both brought in to review the literature on the minimum age of legal responsibility, a matter initiated by the Young Offenders Act (YOA) of 1984. Policymakers intended the YOA to replace the nearly 75-year-old Juvenile Delinquents Act (JDA) of 1908. At that time, I was part of a university-led, cross-provincial research project examining the existing JDA. Our primary goal was to describe how the six provinces involved in the study had implemented the JDA and to assess the perspectives of key interest groups, including police, youth probation officers, defence attorneys, prosecutors, and judges (Corrado et al., 1983). This controversial policy issue revolved around the proposed bill's assertion that youth were capable of rational choice and, as such, deserved the same due process as adults.

In contrast, the JDA was based on the Welfare Model, which assumed that children and adolescents lacked the capacity for rational choice due to innate immaturity and negative influences from family and community. As a result, they were neither legally processed nor subjected to punishment for their "non-crimes" or delinquent behaviours. Instead, juvenile courts were generally required to base any interventions on the "best interests" of the youth (see Corrado et al., 2006). By the late 1970s, David had already established himself as a leading scholar in developmental theoretical perspectives and related policies in youth justice. His recognition largely stemmed from his involvement in the Cambridge Study in Delinquent Development (CSDD), which was initiated in 1961 by Professor Donald West. This study focused on 411 families in a working-class neighborhood in East London. In 1982, David became the principal investigator of this study (see Farrington et al., 2021).

As a psychologist and criminologist, David introduced a more nuanced developmental perspective on children's and adolescents' decision-making processes, challenging the then-dominant sociological-psychological framework epitomized by Hirschi's Social Bond theory, which emerged in the late 1960s (Hirschi, 1969). Throughout his year in Ottawa, I had the opportunity to discuss several theoretical themes with him, particularly focusing on my question about why Social Bond Theory and the broader criminological developmental perspective overlooked key personality constructs from the extensive body of developmental psychology theoretical perspective. Most importantly, Hirschi and others emphasized the construct of temperament-related impulsivity, or low self-control, independent of a developmental stage in explaining delinquency, including serious and violent offending. This narrow and time-invariant focus on low self-control culminated in Gottfredson and Hirschi's 1990 seminal and brilliant book, *A General Theory of Crime*, which sparked ongoing debates about the validity of a predominantly single-construct theory of crime.

When I met David, I was working with a psychologist, Professor Ron Roesch, my colleague in the School of Criminology, who also held a joint appointment in the Psychology Department at Simon Fraser University (SFU). Like David, Ron and I were profoundly influenced by the research design and validity issues initially raised by the renowned psychologist and methodologist Professor Donald Campbell (Cook & Campbell, 1979) in the late 1960s, and, subsequently, by his co-author, psychologist Professor Tom Cook at Northwestern University in the 1970s. These validity concerns influenced scholars to integrate psychological constructs into theories of crime and delinquency. Such constructs allowed for internal and external validity assessments, including, most importantly, construct validity. David, Ron, and I shared the view that the early sociological theories of crime largely dismissed the psychological basis of crime, relegating it to an unknowable "black box" – that is, a methodological acknowledgement that deeply embedded motivations were largely beyond analytic reach within this framework. Secondly, simple constructs such as impulsivity and low self-control were inadequate unless subjected to a range of validity assessments. Professor Alfred Blumstein, Dr. Jacqueline Cohen, and David (1988) expanded their earlier assertions regarding the key developmental construct of the "career criminal," which had been introduced in the 1970s. Hirschi (1969), initially on his own and later with Gottfredson (Gottfredson & Hirschi, 1986), challenged the utility of this construct and the use of large, costly cohort studies to validate its sequential developmental stage assertions. Instead, they argued that cross-sectional studies were sufficient and provided overwhelming support for their claim that the age-invariant construct of low self-control was central to understanding delinquency and criminality across all age stages.

Building on our mutual interests in developmental psychology theories of delinquency and crime and the theoretical debates mentioned above, David nominated me for a visiting scholar position at the Institute of Criminology at the University of Cambridge for the 1985-1986 academic year. David's influence was also evident in Canada, particularly at the University of Montreal, where renowned scholars, Professors Marcel Frechette, Marc Le Blanc (School of Criminology), and Richard E. Tremblay were prominent (Department of Psychology).

The CSDD project and David's collaborations with Professor Le Blanc, beginning with the 1980 Canadian Juvenile Justice Project, led to Professor Le Blanc and colleagues' large cohort study of children and youth in Montreal, subsequently expanding to Quebec (see Le Blanc & Frechette, 1989). Around the same time, Professor Trembley initiated his developmental cohort study of aggression and violence, called the Montreal Longitudinal and Experimental Study (MLES), utilizing a large Montreal sample of families with toddlers in 1984 (see Tremblay et al., 2003). During my time with David at Cambridge and in our subsequent discussions, it became evident that the research designs of these delinquency and child cohort studies, understandably, tended to under-sample serious and violent offenders. Similarly, despite its large and near-representative sample, Arseneault et al.'s (2000) renowned Dunedin longitudinal cohort study in New Zealand also had a limited proportion of seriously violent offenders. These limitations raised two key questions for me: (1) are developmental theories of delinquency inadequate to explain serious and violent offending? and (2) do the variables associated with general delinquency differ in type, sequences, or intensity for serious and violent offenders? And, if so, does this necessitate distinct interventions to mitigate the likelihood of serious and violent offending trajectories?

By the early 1990s, serious and violent offending had become a contentious political and policy issue in Canada. While there was debate over whether serious and violent offending had increased during the 1980s and early 1990s, our research supported the view that such an increase did occur (Corrado & Markwart, 1994). Additionally, there was an emergence in both major adult gang activities - partly involving more recent immigrant groups - and violent informal street gangs or groups comprising of primarily youth members. Moreover, several notorious incidents involving excessively brutal murders committed by repeat violent young offenders captured public attention. These events fueled an intense political and media-driven debate advocating for the replacement of the YOA with legislation that imposed lengthier and more severe sentences for young offenders. The debate grew so intense that it became a key political issue. The Reform Party was subsequently created, and among its major platform objectives was the replacement of the YOA with a far more punitive youth justice law aimed at protecting the public (Youth Criminal Justice Act, 2002).

In the mid-1990s, Ron and I approached several psychologists and psychiatrists specializing in youth violence in Canada, the United States, and Western Europe to propose a North Atlantic Treaty Organization (NATO) research workshop grant aimed at developing a risk/needs assessment instrument for serious and violent young offenders. Of course, David readily agreed to participate, along with his colleague, Professor Friedrich Lösel, who was then the Director of Psychology at the University of Erlangen-Nuremberg. We co-led the successful NATO application with Dr. Giovanni Traverso, an Italian psychiatrist from the University of Siena, and psychologist Dr. Theresa Wojekowski from Jagiellonian University in Kraków, Poland. Professor Stephen D. Hart, a clinical psychologist from the psychology department at SFU, also played a major role in constructing the Cracow instrument discussed in the next section, specifically focusing on personality disorders, most importantly, psychopathy. David also began to focus his cohort research on interventions for youth involved in criminal activities and within the youth correctional system (Farrington, 1994). His initial emphasis was on older children since criminal responsibility in the UK began at age eight. However, through his involvement in the Pittsburgh studies with psychologist Dr. Rolf Loeber and colleagues, as well as with other cohort studies internationally, he expanded his research to include an array of risk profiles and intervention strategies (see Ahonen et al., 2021).

The NATO workshop team agreed that a policy priority regarding serious and violent young offenders should not be the development of a risk prediction instrument for criminal justice agencies. Rather, given the substantial body of developmental psychology and developmental criminology research on risks for serious and violent offending, the focus should be on creating an intervention and case management tool. Such an instrument would be most helpful for families with at-risk youth and for multi-agency programs responsible for at-risk children, adolescents and even young adults. This tool would support individualized case planning and management by tailoring intervention programs to align with each youth's specific risk and needs profile, reducing the likelihood of subsequent serious or violent offending. The initial draft of this instrument was presented by Corrado's team in the NATO-sponsored volume (Corrado et al., 2002; Odgers et al., 2002). Two subsequent validation studies were conducted by Lösel et al. (2025), Lussier et al. (2011), and Wallner et al. (2018) which will be discussed in the next section.

Cracow Risk/Needs Assessment Instrument for Serious and Violent Offenders: Outline and Validity Studies

Farrington's developmental theoretical framework was instrumental in creating the comprehensive risk/needs intervention and case management tool, the Cracow Instrument (Lussier et al., 2011). The CI was designed to help agencies identify children and adolescents at risk of, or currently involved in, serious and violent behaviour using indicators from five major developmental stages developmental stages, see Figure 1 (Lussier et al., 2011). Each stage includes unique age-related risk and needs indicators that can accumulate over time (Lussier et al., 2011; see Figure 1). The CI is designed to provide agencies with a template for individualized intervention and prevention plans. The utility of the CI has been examined by Wallner et al. (2018), Lussier et al. (2011), and Lösel et al. (2025) who all found evidence to support the CI in

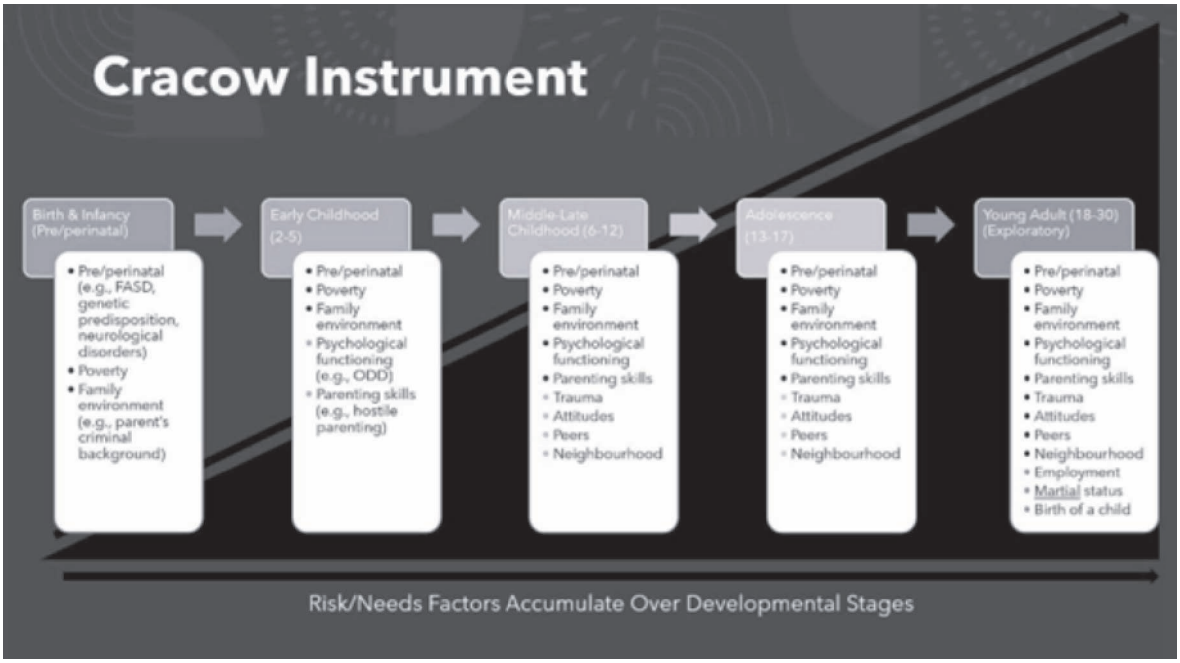

Figure 1: Cracow Instrument

predicting antisocial development in children. For instance, highly aggressive children tend to present multiple and accumulative risk factors such as poor parenting skills/education, economic dependency, and prenatal and perinatal risk factors (see Lussier et al., 2011).

Integrated Developmental and Life-Course Theories of Offending and Farrington's Integrated Cognitive Anti-Social Potential Theory: Influence on Corrado et al. (2019) Seven Pathway Models for Interventions

By 2005, Farrington had formalized his extensive research on the risk factors for delinquency and crime, incorporating factors and models developed by his contemporaries, such as Piquero and Moffitt (2005), Tremblay et al. (2003), Loeber et al. (1990), Catalano et al. (2005), Le Blanc (2005), Sampson and Laub (2005), and Wikström (2005), among others. However, in my discussions with David and Professor Friedrich Lösel, I raised a theoretical question: are there distinctive developmental pathways to serious violent offending, such as violence, sexual offences, and homicide? This issue is particularly relevant in Canada, where the Youth Criminal Justice Act (2002) prioritizes limiting major prison sentences to these types of major violent crimes. The act also emphasizes intervention programs within youth corrections facilities and subsequent reintegration into the community upon release. Another concern in youth correctional institutions across Canadian provinces were the disproportionate number of Indigenous violent offenders receiving longer prison sentences and the overall overrepresentation of Indigenous people in custody (Department of Justice, n.d.). Additionally, there were increasing challenges in providing comprehensive needs assessments and institution-based and community-based case planning, especially for youth with developmental neurological disorders such as attention-deficit/hyperactive disorder, fetal alcohol spectrum disorder and autism. Similar policy issues were also evident in Australian correctional institutions, and specific USA states with large populations of youth gang members among imprisoned offenders, such as California and Illinois (e.g., Fisher et al., 2008).

The Office of the Representative for Children and Youth in British Columbia, a politically independent oversight institution, approached me to undertake a project to determine whether distinct risk/needs pathways could be identified among children and youth who had been involved in government intervention programs designed to support children and youth in need of protection. A specific concern was whether there was a disproportionate number of young offenders in custody who had previously been involved in the child welfare system, particularly those placed in foster care. My team and I were granted unprecedented access to confidential information from the RCYBC files, including data from key ministries, such as the Ministry of Education and Child Care, the Ministry of Children and Family Development, and youth corrections services. Based on the primary potential causal risk factor for serious and violent offending, six pathways were identified from both aggregate analyses and several in-depth case analyses (see Corrado et al., 2015).

Furthermore, for each risk pathway, similar to the Cracow instrument, a series of interventions and resources were outlined for potential case planning at various levels (i.e., administrative, policy, and individual management/supervision; see Corrado et al., 2015). In addition to the CI, my work with Dr. Lauren F. Freedman, Dr. Alan Leschied, and Professor Jennifer Wong (e.g.,

Corrado et al., 2015; Freedman et al., 2017) highlighted the importance of also identifying distinct developmental pathways associated with serious and violent offending. Each pathway represents a unique trajectory requiring tailored intervention strategies to address primary causal risk factors. These factors can trigger a cascade of events that increase the likelihood of criminal justice involvement. We identified six pathways, including the prenatal/neurological risk pathway, the childhood personality disorder pathway, the extreme childhood temperament pathway, the childhood maltreatment pathway, the adolescent onset pathway, and the post-childhood trauma pathway.

For example, the childhood personality disorder pathway suggests that disorders such as Conduct Disorder (CD), Oppositional Defiant Disorder (ODD), or the presence of early onset persistent callous-unemotional traits typically emerge in the post-toddler stage. In this context, family-based risk factors, such as inconsistent discipline, family breakdown - can have an aggravating effect, therefore, a focus on caregiver information and caregiver resources and programs are helpful in responding to early signs of a personality disorder (e.g., Corrado et al., 2015).

Based on our current project in Surrey, outlined below, a seventh pathway has been hypothesized, i.e., the cultural gang pathway to youth criminal justice system involvement.

Surrey Youth Gang Project

The gang pathway has historically been associated with the most prolific and sustained aggression, both in practise and theoretically. Much of the existing gang research has overwhelmingly focused on the cultural, structural, and organizational aspects of gangs situated in the USA. Arguably, David's theory does not specifically aim to explain the complex gang phenomenon, as the focus is on delinquency and crime more broadly, however, it does encompass many risk factors commonly linked to gang involvement, such as neighborhood poverty, instability, and family criminality (Farrington et al., 2017). In British Columbia since 1990s, the classic model of risk factors for gang involvement does not seem to apply to the emergence of the most notorious and violent largely adult organized crime gangs. Most importantly, mixed race/ethnic second-generation young men from middle- or high-income families from largely stable communities and families have been involved in formal gangs mainly in the Greater Vancouver metropolitan region but increasingly elsewhere in suburban cities in British Columbia. The policy issue that emerged has been identifying the risk factors associated with this relatively novel profile and recruitment dynamic to mitigate the likelihood of older adolescents and young adults becoming gang involved. *The Altering Pathways to Youth Gang Violence: Community Pathways Project 2.0* was established to explore the utility of the CI and pathway models in assisting an integrated multi-agency prevention/intervention program (the Surrey Anti-gang and Family Empowerment program) in case management of at-risk youth in the community. Our preliminary results suggest a distinct cultural pathway to gang involvement that surrounds unique risk factors such as language barriers, lack of identity, negative family/school environment, and lack of belonging that are contributing to gang-involvement (Corrado et al., 2019). David's theoretical and policy influence on my research and my colleagues research has been profound and continuing. Beyond this, I am grateful for his persistent encouragement and kindness throughout my career.

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RASSEGNA ITALIANA DI CRIMINOLOGIA ANNO XIX N.3 2025

Società Italiana di Criminologia

Articoli generali

Testing the Integrated Cognitive Antisocial Potential (ICAP) theory: what is the role of sex?

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Abstract

Background: For decades, crime has been perceived as a predominantly male phenomenon. As a consequence, most criminological theories have focused on male offenders, often overlooking the possibility that female delinquency may not be adequately explained by the same theoretical models. The Integrated Cognitive Antisocial Potential (ICAP) theory is a male-centered framework that predicts delinquent behaviors based on antisocial attitudes. This study aims to assess wether the ICAP theory can effectively predict delinquency in both female and male samples. Additionally, it examines the moderation effect of participants' sex in the relationship between antisocial attitudes and juvenile delinquency, distinguishing between violent and non-violent offenses.

Methods: The sample (N = 491) comprises participants recruited from a public school in the Center Region of Portugal and a forensic sample recruited from 4 Juvenile Detention Centers. Of the total participants, 43.4% of the participants are female and 56.6% are male adolescents and young adults. Delinquent behavior was assessed using the International Self-Report Delinquency 3 questionnaire (ISRD-3), while antisocial attitudes were measured using the Antisocial Attitudes scale.

Results: Findings indicate that aggressive and antisystem attitudes significantly predict offending behavior. Further, participants' sex moderates the relationship between antisocial attitudes and non-violent offenses, but not violent offenses.

Conclusions: Present findings showed that the theory effectively predicts delinquency through aggressive and antisystem attitudes. However, its applicability to female offenders may require adjustments. Future research should explore additional factors influencing female delinquency.

Keywords: antisocial attitudes, ICAP theory, juvenile delinquency, Portugal, sex

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Testing the Integrated Cognitive Antisocial Potential (ICAP) theory: what is the role of sex?

Introduction

The Integrated Cognitive Antisocial Potential (ICAP) theory, developed by Farrington (2005), is a foundational framework within developmental and life-course theories. The ICAP framework (see Figure 1) integrates elements from strain, control, labeling, and rational choice theories (Farrington & Ttofi, 2017) to explain the development of delinquency. However, the key construct in the ICAP theory is antisocial potential (AP). This theoretical model differentiates between long-term AP, influenced by risk and protective factors, and short-term AP, shaped by situational factors (Farrington & McGee, 2018). ICAP also considers cognitive processes where individuals evaluate the cost and benefits of offending, with AP influenced by perceived consequences of offending, whether resulting from punishment, reinforcement, or labeling (Farrington & McGee, 2017).

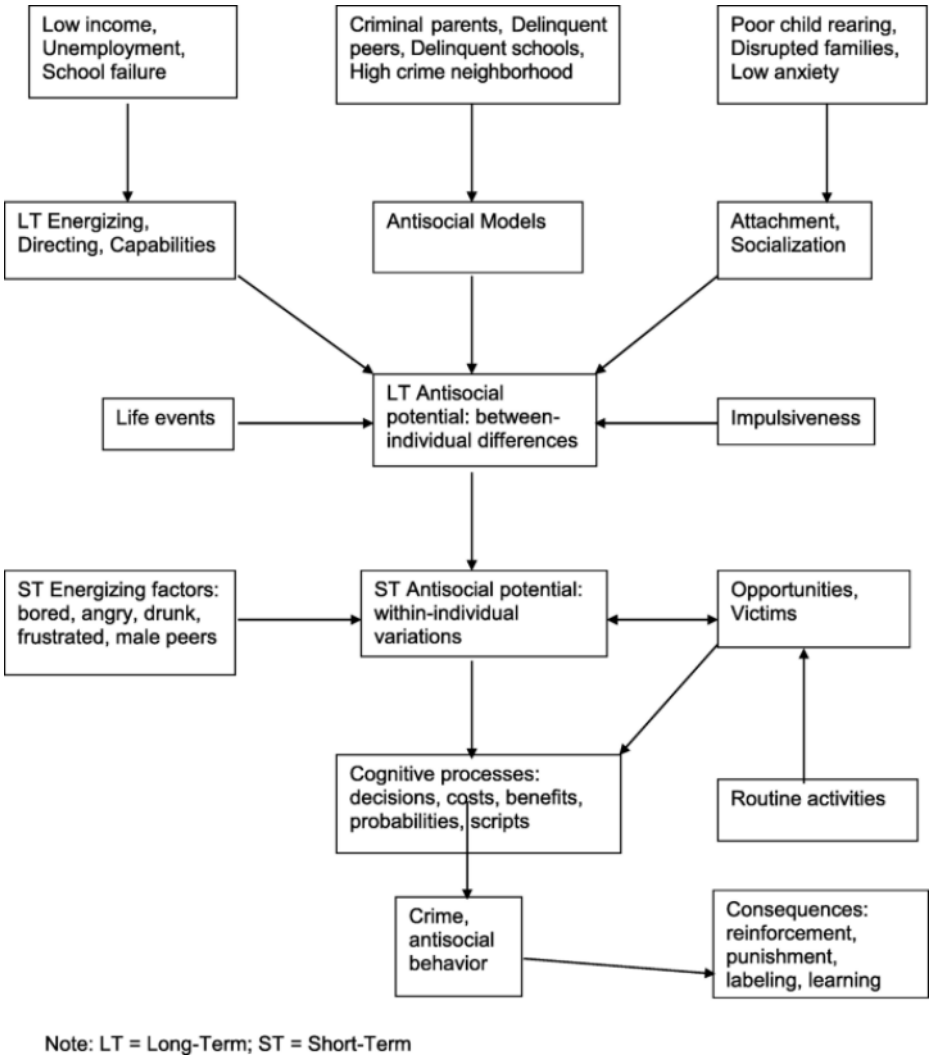

Figure 1 The Integrated Cognitive Antisocial Potential (ICAP) Theory

Long-term AP is influenced by risk factors, including stress, exposure to antisocial models (from parents and peers), socialization, impulsiveness, and life events; while short-term AP is contingent on immediate motivational and situational factors, such as anger or crime opportunity (Farrington & McGee, 2017). Furthermore, ICAP theory incorporates evidence on the versatility of antisocial behavior, suggesting that frequent offenders are prone to multiple crime types rather than specializing in a single offense category. Capaldi and Patterson (1996) concluded that the etiology of frequent offending relates to long-term risk factors. In contrast, the type of committed crime seems more impacted by the context-specific opportunities in the environment (Capaldi & Patterson, 1996). As a result, ICAP was proposed as a general theory that explains offending across different types of antisocial behaviors, from substance use to property and violent crimes (Farrington & McGee, 2017), indicating that individuals with high AP are more likely to engage in antisocial acts. However, situational factors may influence which specific offense is committed. Farrington and McGee (2017) hypothesized that long-term AP broadly predicts delinquency, while short-term AP could vary by crime type.

West and Farrington (1977) first measured long-term AP within the Cambridge Study in Delinquent Development (CSDD) using the Antisocial Attitudes (AA) scale (Farrington & McGee, 2017). The CSDD is a prospective longitudinal study of 411 working-class Caucasian British males born in 1953, followed from age 8 onward across their life courses. Within the study, this cohort is classified as Generation 2 (G2 males). The AA scale includes two subscales: Aggressive attitudes scale (e.g., "If someone hits me first, I really let him have it") and Anti-establishment attitudes scale (e.g., "Anyone who works hard is stupid") (Farrington & McGee, 2017). Farrington and McGee's (2017, 2018) testing of ICAP theory within the CSDD indicates that high long-term AA scores successfully predict convictions in G2 males.

The ICAP theory posits that AP remains relatively stable over the life course. Supporting this central proposition, Farrington and McGee (2017) found AA scores to be stable across ages, with highly antisocial G2 men at 18 tending to remain more antisocial throughout life compared to other participants in the sample. However, absolute values of AP decreased with age (Farrington & McGee, 2017). Further, Farrington and McGee (2018) replicated these findings with G2 males' sons (G3 males), showing that AP predicted antisocial behavior at age 25. Gomes et al. (2023) investigated the sample used in this study dividing it into three different age groups (13 –15 years old; 16 –17 years old; 18 –21 years old). They found that AP did not significantly differ among these age groups. However, a non-statistically significant visual trend was found in the long-term antisocial potential values, resembling the age-crime curve (Gomes et al., 2023).

ICAP theory was originally developed to explain offending among lower-class males (Farrington & McGee, 2017). However, Farrington (2019) highlighted the need to examine if the ICAP theory could also explain female offending, given that risk factors may impact males and females differently, potentially requiring adjustments to the model. Additionally, as the CSDD male participants grew up in contexts quite different from those faced by today's youth, questions arise about the theory's applicability to contemporary offenders of both genders (Farrington & Painter, 2004).

Current research on gender differences in antisocial attitudes remains inconclusive. Some studies suggest no significant differences between males and females (Ardelt & Day, 2002; Bendixen & Olweus, 1999; Hurioglu & Tumkaya, 2016; Stevenson et al., 2004; Walters et al., 1998), while most indicate that males exhibit higher antisocial attitudes (Butler et al., 2007; Butler et al., 2015; Gomes et al., 2022, 2023; Huesmann & Guerra, 1997), and some even report the opposite (Mazher et al., 2022; Walters, 2002).

For instance, research has shown that higher cognitive distortions is correlated with the externalization of problematic and antisocial behavior regardless of race, gender, and age (Helmond et al., 2014). Nonetheless, females report fewer cognitive distortions than males (Lardén et al., 2006; Tangney et al., 2012). Crick and Dodge (1994) propose that male cognition may be more instrumental, while female cognitions tend to be more interpersonal, which may lead males toward self-serving cognitive distortions (Gomes et al., 2022) and females toward greater pro-sociality (Hoffmann et al., 2004) and social competence (Merrell, 1993), which may increase the risk of male delinquency (Lardén et al., 2006).

Butler and Leschied (2007) examined the Antisocial Beliefs and Attitudes Scale (ABAS), a self-report instrument that assesses antisocial thinking across three main factors: Rule Non-Compliance, Peer Conflict, and Severe Aggression. In a sample of 425 children (ages 10-18), boys scored significantly higher than girls on Peer Conflict and Severe Aggression, while no significant sex differences emerged for Rule Non-Compliance.

Buss and Perry (1992) applied their Aggression Questionnaire (AQ) to a sample of 1253 participants (51.1% women) and found that men scored significantly higher than women on Physical Aggression, Verbal Aggression, and Hostility, but not on Anger. This suggests that although women experience the same levels of anger as men, however, their expression may be inhibited by means of different cognitive processes.

Tangney et al. (2012) used the 25-item Criminogenic Cognitions Scale (CCS) and found that women scored lower than men on most dimensions, namely Notions of Entitlement, Short-Term Orientation, Insensitivity to the Impact of Crime, and Negative Attitudes Toward Authority). However, no gender differences were found in Failure to Accept Responsibility. In contrast, Vaske et al. (2017) found no gender differences in the CCS dimensions.

Another line of research has employed the Measures of Criminal Attitudes and Associates (MCAA), a widely used tool for assessing criminal attitudes. The MCAA con-

sists of two parts: Part A, which assesses peer offending, and Part B, which measures attitudes across four scales - Violence, Entitlement, Antisocial Intent, and Characteristics of Associates (Mills et. al., 2004). In Sweeden, Bäckström and Björklund (2008) analyzed the MCAA with an online sample and a sample of criminal offenders. Results showed that females scored lower than males in Positive Attitudes Towards Criminality, Antisocial Intent, and Violence in the online sample. Among offenders, males displayed higher scores in Antisocial Intent and Associates. Contrarily, O'Hagan et al. (2019) applied the MCAA scale to a sample of 300 justice-involved youth in Canada and found no differences between genders. These findings highlight potential sex differences in criminal cognition across populations.

Walters (2002) conducted a meta-analysis on the Psychological Inventory of Criminal Thinking Styles (PICTS), a self-report inventory designed to capture deviant thinking patterns associated with criminal behavior. Two studies analyzed adult female samples (Walters & Elliott, 1999; Walters et al., 1998), and both found higher PICTS scores compared to a male sample (Walters, 1995), suggesting that female offenders may exhibit more cognitively deviant tendencies, possibly due to the heightened social unacceptability of female antisocial behavior (Walters, 2002).

Vaske et al. (2017) suggest that this inconsistency may stem from varying definitions of "criminal thinking", which includes both the content (e.g., negative attitudes toward authority, favorable views of antisocial behavior) and processes (e.g., a negative worldview). Different measurement approaches capture distinct facets of criminal cognition, thereby complicating whether antisocial attitudes consistently differ across genders. Moreover, internal consistency tends to be lower for females than for males, indicating that these scales are more effective at predicting antisocial behavior and attitudes in males than in females (Bendixen & Olweus, 1999; Vaske et al., 2017).

The present study aims to test the ICAP theory's fundamental hypotheses by examining whether anti-establishment and aggressive attitudes predict self-reported juvenile delinquency. Additionally, we seek to determine if sex moderates the relationship between these antisocial attitudes and different types of offending (overall, violent, and property offending). Focusing on antisocial attitudes as predictors of delinquency in both males and females, this study utilizes a diverse sample of community and forensic settings. By combining participants from schools and juvenile detention facilities, we aim to capture a broad spectrum of delinquent behavior in minors and young adults, enhancing the generalizability of our results.

This study includes four hypotheses: H1: high antisocial attitude scores predict higher levels of delinquent behavior; H2: sex moderates the relationship between antisocial attitudes and overall delinquent behavior; H3: sex moderates the relationship between antisocial attitudes and property delinquency; and H4: sex moderates the relationship between antisocial attitudes and violent delinquency.

Methods

Participants

Eligible participants of the present study consisted of a total of 518 adolescents and young adults. From this total, 409 were recruited from a school context (79.0%) and 109 from a forensic context (21.0%), chosen by geographical convenience. A total of 27 participants were excluded from the study's database due to non-response to the selected measures. Regarding the school sample, 195 of the participants are females (50.1%) and 194 are males (49.9%), recruited from a school in the Center region of Portugal, aged between 13 and 21 years (M = 15.41, SD = 1.75). The forensic context sample includes 18 females (17.6%) and 84 males (82.4%), and participants were 13 to 20 years of age (M = 16.09, SD = 1.27), recruited from four juvenile detention facilities of the Portuguese Ministry of Justice, three in the Lisbon region and one in the North region of Portugal. At the time of the data collection, all young girls convicted in juvenile detention facilities in Portugal were recruited for the present study. The final sample was composed of a total of 213 females (43.4%) and 278 males (56.6%), aged 13 to 21 years (M = 15.54, SD = 1.69). The nationality of the final sample was mainly Portuguese (95.9%).

Measures

The variables of this study were operationalized using two questionnaires, to evaluate antisocial attitudes the Antisocial Attitude scale (AA), and the International Self-Report Delinquency 3 (ISRD3) to assess lifetime self-report offending and sociodemographic variables.

Antisocial Attitude Scale (AA; Farrington & McGee, 2017; Portuguese version by Gomes et al., 2023). The AA was originally developed within the Cambridge Study in Delinquent Development (West & Farrington, 1977) and revised by Farrington and McGee (2017). Farrington and McGee (2017) found that the AA scale demonstrated adequate internal consistency within G2 males (= .72 at age 18, = .67 at age 32, and = .71 at age 48). This version is a 23-item self-report scale that measures long-term antisocial potential using statements representative of antisocial attitudes which predicts delinquency, composed of 2 subscales, 13 items assess aggressive attitudes (e.g., "If someone does the dirty on me I always try to get my own back") and 10 items evaluate anti-establishment attitudes (e.g., "The police are always roughing people up"). The AA scale used a 4-point Likert scale response format ranging from definitely true, probably true, probably false, and definitely false. High AA scores correspond to high antisocial attitudes. The internal consistency of this scale in the present study was high (= .85).

International Self-Report Delinquency 3 (ISRD3; Enzmann et al., 2018; Portuguese version by Martins et al.,

2015). The ISRD3 questionnaire is a self-report survey designed to study illegal and social behavior considered to be undesirable, validated by the Portuguese youth. This questionnaire is comprised of 11 modules (i.e., demographic background; family; school; victimization; leisure and peers; attitudes and values; offending; substance use; norm transmission strength; procedural justice, and peer influence). In this study, only the demographic background and offending modules will be taken into consideration. The demographic background module included 15 items concerning sex, age, demographic and social characteristics, household structure, religion, and questions regarding the economic and financial situation of the participants. The offending module consists of 15 items regarding lifetime and last-year offending. The offenses present in the ISRD3 questionnaire include graffiti, vandalism, shoplifting, burglary, bicycle theft, car theft, stealing from a car, robbery, assault, stealing from a person, carrying a weapon, group fight, animal cruelty, drug trafficking, and illegal downloading. For this study, we chose to discard the items concerning illegal downloading, animal cruelty, and graffiti, creating a measure of variety of delinquency (Sweeten, 2012), with a maximum score of 12, which represents the highest number of offenses committed last year and throughout life. The 12 ISRD3 items were divided into two composite variables: violent offenses (robbery, assault, carrying a weapon, group fight) and property offenses (vandalism, shoplifting, burglary, bicycle theft, car theft, stealing from a person, carrying a weapon and drug trafficking; Doelman et al., 2021).

In this study, two different data collection approaches were put into practice, due to the nature of the original research projects they were inserted in. The forensic sample was part of a cross-sectional study, collected in a single moment. Contrarily, the community sample's data integrated a small longitudinal study, over one year. Data was collected at three distinct moments, separated by six months, where the AA questionnaire was only administered during the final data collection moment. Concerning ISRD3, this questionnaire was applied to all data collection moments. In the first moment, participants were questioned regarding lifetime offending. In contrast, participants were specifically asked about their engagement in offending behaviors over the last 6 months in the middle and final moments. Subsequently, a composite variable representing the prevalence of lifetime offending was constructed by integrating the data obtained from the first collection moment and summing any new offenses that may have occurred over the last two moments.

Procedures

Ethical approval was granted from all institutions involved in this project, the University of Minho Ethics Committee; the Directorate-General for Education (*Direção-Geral da Educação*), which was obtained through the School Surveillance Monitoring System (*Monitorização de Inquéritos em Meio Escolar*); and the Directorate-General for Reintegration and Prison Services (*Direcção-Geral de Reinserção e Serviços Prisionais–Ministério da Justiça*). Ethical approvals were also obtained from the principal of the school involved in the study and from the Directors of the Juvenile Detention Facilities (*Centros Educativos*) for the forensic sample. Lastly, informed consent forms were provided to the underage participants' legal guardians to participate in the study. After meeting this criterion, the research team began an in-person data collection process. All respondents participated voluntarily and were given clear instructions to ensure they were aware their testimony was confidential, preventing participant bias. Questionnaires were completed in a paper-and-pencil format in a classroom by the community sample and in a designated room by the forensic sample, only the researcher and participants were present during the data collection. The length of the data collection *per* classroom and designated room took an average of 45 minutes. The participants were not given any form of monetary compensation.

Statistical analysis

All statistical analyses were performed using the 28th version of the IBM® SPSS® (Statistical Package for the Social Sciences) software. The significance level was set at a p-value probability of < .05. Preliminary analyses were used to characterize the sample using the mean and standard deviation, providing a summary of the sample's sociodemographic information and lifetime offending. We carried out 9 moderation models to test our hypothesis. In all moderation models, we considered age and group (i.e., community and forensic sample) as covariates. For all moderation hypotheses, three different outcomes regarding antisocial attitudes were considered, the total long-term antisocial potential, and the two sub-scales of the antisocial attitudes scale: aggressive attitudes and anti-establishment attitudes.

Results

As a preliminary analysis, we analyzed the prevalence of each offending behavior in the current sample. At least 51.3% (n = 252) of participants reported having committed at least one offense throughout life. Table 1 shows different types of offending, the most frequently reported being shoplifting (29.7%, n = 146), taking part in a group fight (27.6%, n = 135), and stealing from a person (25.1%, n = 123). Chi-square tests of independence revealed a statistically significant association between all offenses and sex, except for shoplifting. Independent t-tests displayed significant differences in variety scores between females and males. For overall delinquency, females (M = 1.04, SD = 1.88) showed significantly lower variety scores than males (M = 2.67, SD = 3.47). Chi-square tests revealed significant differences in the prevalence of offending between females and males. Overall delinquency prevalence was significantly lower among females (39.4%) than males (60.4%).

	Total	Females	Males	*t*	*p*
Variety scores	M (SD)	M (SD)	M (SD)		
Overall delinquency	1.96 (3.00)	1.04 (1.88)	2.67 (3.47)	6.17	< .001
Property crimes	1.12 (1.85)	0.54 (1.00)	1.56 (2.19)	6.33	< .001
Violent crimes	0.67 (1.09)	0.38 (0.83)	0.90 (1.21)	5.37	< .001
Prevalence scores	*n* (%)	*n* (%)	*n* (%)	χ^2	*p*
Overall delinquency	252 (51.3)	84 (39.4)	168 (60.4)	21.28	< .001
Property crimes	208 (42.4)	69 (32.4)	139 (50.0)	15.31	< .001
Violent crimes	178 (36.3)	47 (22.1)	131 (47.1)	32.76	< .001
Delinquency items					
Vandalism	76 (15.5)	14 (6.6)	62 (22.4)	22.97	< .001
Shoplifting	146 (29.7)	54 (25.4)	92 (33.1)	3.10	.063
Burglary	43 (8.8)	2 (0.9)	41 (14.9)	29.03	< .001
Bike theft	66 (13.4)	3 (1.4)	63 (22.7)	46.82	< .001
Car theft	44 (9.0)	4 (1.9)	40 (14.4)	23.25	< .001
Stealing from a car	52 (10.6)	5 (2.3)	47 (17.0)	27.13	< .001
Robbery	48 (9.8)	9 (4.2)	39 (14.0)	13.14	< .001
Stealing from a person	123 (25.1)	33 (15.5)	90 (32.4)	18.30	< .001
Carrying a weapon	103 (21.1)	26 (12.2)	77 (27.9)	17.80	< .001
Group fight	135 (27.6)	34 (16.0)	101 (36.6)	25.61	< .001
Assault	43 (8.8)	11 (5.2)	32 (11.6)	6.26	.012
Drug sales	84 (17.2)	27 (12.7)	57 (20.7)	5.27	.022

Table 1
Frequencies and Chi-Square Results for Types of Offenses and Sex

To address hypothesis one, we carried out 3 Models: (1) sex moderates the relationship between total antisocial attitudes and juvenile delinquency (Model 1); (2) sex moderates the relationship between aggressive attitudes and juvenile delinquency (Model 2); and (3) sex moderates the relationship between anti-establishment attitudes and juvenile delinquency (Model 3). Model 1 explained 63% of the variance in juvenile delinquency (see Table 2, *Moderation Models*). As Table 2 demonstrates, regardless of the type of antisocial attitudes, results are very similar. A statistically significant direct effect of antisocial attitudes on offending was found (Model 1: $b = 2.73$, $p < .001$; Model 2: $b = 2.08$, $p < .001$; Model 3: $b = 1.90$, $p < .001$); an effect of sex on offending (Model 1: $b = 2.19$, $p < .001$; Model 2: $b = 1.59$, $p < .01$; Model 3: $b = 0.80$, $p < .1$); and a significant interaction effect (Model 1: $b = -1.15$, $p < .01$); Model 2: $b = -0.81$, $p < .05$; Model 3: $b = -0.85$ $p < .05$), where the effect of antisocial attitudes on offending is significantly stronger for males than for females (see Table 3). Figure 2 illustrates this effect, indicating that as antisocial attitudes increase, overall offending increases more sharply for males than females.

For testing hypothesis two, we conducted Models 4, 5, and 6: (4) sex moderates the relationship between total antisocial attitudes and non-violent offending (Model 4); (5) sex moderates the relationship between aggressive attitudes and non-violent offending (Model 5); and (6) sex moderates the relationship between anti-establishment attitudes and non-violent offending (Model 6). Model 4 explained 58% of the variance in non-violent juvenile delinquency (see Table 2). Table 2 demonstrates similar results, regardless of the type of antisocial attitude. A strong direct effect of antisocial attitudes on non-violent offending was found (Model 4: $b = 1.57$, $p < .001$; Model 5: $b = 1.21$, $p < .001$; Model 6: $b = 1.05$, $p < .001$); an effect of sex on non-violent offending (Model 4: $b = 1.84$, $p < .001$; Model 5: $b = 1.41$, $p < .01$; Model 3: $b = 1.08$, $p < .05$); and a significant interaction effect of antisocial attitudes on non-violent offending (Model 4: $b = -1.03$, $p < .001$; Model 5: $b = -0.79$, $p < .001$; Model 6: $b = -0.70$, $p < .01$). Similarly, the link between antisocial attitudes and overall offending is stronger for males than for females (see Table 3). Interestingly, in Model 6, conditional effects show that antisystem attitudes are only a statistically sig-

Table 2 Moderation Models

	Coeff	SE	95% CI	Coeff	SE	95% CI	Coeff	SE	95% CI
	Model 1 (AA*Sex – Overall offend.)			**Model 2 (Aggr.*Sex – Overall offend.)**			**Model 3 (A-Est.*Sex – Overall offend.)**		
Attitudes	2.73	0.27***	[2.205; 3.261]	2.08	0.22***	[1.651; 2.500]	1.90	0.28***	[1.349; 2.440]
Sex	2.19	0.76**	[0.698; 3.677]	1.59	0.63*	[0.350; 2.825]	1.33	0.80†	[-0.246; 2.910]
Attitudes*Sex	-1.15	0.39**	[-1.920; -0.378]	-0.81	0.32*	[-1.449; -0.175]	-0.85	0.41*	[-1.662; -0.036]
Age	0.12	0.05*	[0.021; 0.214]	0.13	0.05*	[0.031; 0.227]	0.09	0.25†	[-0.009; 0.196]
Group	4.00	.24***	[3.526; 4.478]	4.15	0.24***	[3.670; 4.625]	4.55	0.05***	[4.065; 5.031]
R^2		.63			.62			.58	
	Model 4 (AA*Sex – Non-violent offend.)			**Model 5 (Aggr.*Sex – Non-violent offend.)**			**Model 6 (A-Est.*Sex – Non-violent offend.)**		
Attitudes	1.57	0.18***	[1.224; 1.916]	1.21	0.14***	[0.933; 1.486]	1.05	0.18***	[0.700; 1.405]
Sex	1.84	0.50***	[0.859; 2.814]	1.41	0.41**.	[0.602; 2.213]	1.08	0.52*	[0.059; 2.100]
Attitudes*Sex	-1.03	0.26***	[-1.533; -0.521]	-0.79	0.21***	[-1.200; -0.370]	-0.70	0.27**	[-1.227; -0.176]
Age	0.06	0.03†	[-0.006; 0.121]	0.06	0.03*	[0.001, 0.128]	0.05	0.03ns	[-0.021; 0.111]
Group	2.45	0.16***	[2.135; 2.760]	2.54	0.16***	[2.230, 2.852]	2.74	0.16***	[2.431, 3.055]
R^2		.58			.58			.54	
	Model 7 (AA*Sex –Violent offend.)			**Model 8 (Aggres.*Sex – Violent offend.)**			**Model 9 (A-Est.*Sex – Violent offend.)**		
Attitudes	0.96	0.12***	[0.739; 1.190]	0.72	0.09***	[0.540; 0.903]	0.69	0.12***	[0.461; 0.923]
Sex	0.35	0.33 n.s.	[-0.293; 0.982]	0.17	0.27 n.s.	[-0.361; 0.967]	0.26	0.34 n.s.	[-0.405; 0.931]
Attitudes*Sex	-0.16	0.17 n.s.	[-0.494; 0.166]	-0.06	0.14 n.s.	[-0.336; 0.208]	-0.18	0.18 n.s.	[-0.527; 0.161]
Age	0.43	0.02*	[0.002; 0.085]	0.05	0.02*	[0.005; 0.089]	0.03	0.02ns	[-0.010; 0.077]
Group	1.11	0.10***	[0.908; 1.316]	1.16	0.10***	[0.950; 1.359]	1.32	0.10***	[1.115; 1.523]
R^2		.48			.47			.43	

Note. AA = Antisocial Attitudes; Aggr. = Aggressive Attitudes subscale; A-Est. = Anti-establishment Attitudes subscale; Offend. – Self-reported offending; n.s.= Statistically non-significant; * p < .05; ** p < .01; *** p < .001.

Table 3 Conditional effects

	B	SE	*t*	*p*	95% CI
Model 1 (AA*Sex – Overall offend.)					
Male	2.73	0.27	10.18	<.001	[2.205; 3.261]
Female	1.58	0.31	5.08	<.001	[0.972; 2.196]
Model 2 (Aggr.*Sex – Overall offend.)					
Male	2.08	0.22	9.60	<.001	[1.651; 2.500]
Female	1.26	0.26	4.86	<.001	[0.753; 1.775]
Model 3 (A-Est.*Sex – Overall offend.)					
Male	1.90	0.28	6.82	<.001	[1.349; 2.440]
Female	1.05	0.32	3.26	.001	[0.415; 1.676]
Model 4 (AA*Sex – Non-violent offend.)					
Male	1.57	0.17	8.91	<.001	[1.224; 1.916]
Female	0.54	.20	2.66	.008	[0.142; 0.945]
Model 5 (Aggr.*Sex – Non-violent offend.)					
Male	1.21	0.14	8.59	<.001	[0.933; 1.486]
Female	0.42	0.17	2.51	.013	[0.092; 0.757]

Model 6 (A-Est.*Sex – Non-violent offend.)					
Male	1.05	0.18	5.86	<.001	[0.700; 1.405]
Female	0.35	0.21	1.69	.091	[-0.056, 0.758]
Model 7 (AA*Sex –Violent offend.)					
Male	0.96	0.12	8.39	<.001	[0.739; 1.190]
Female	0.80	0.13	6.00	<.001	[0.538; 1.063]
Model 8 (Aggres.*Sex – Violent offend.)					
Male	0.72	0.09	7.81	<.001	[0.540; 0.903]
Female	0.66	0.11	5.91	<.001	[0.439; 0.876]
Model 9 (A-Est.*Sex – Violent offend.)					
Male	0.69	0.12	5.89	<.001	[0.461; 0.923]
Female	0.51	0.14	3.75	<.001	[0.242, 0.776]

Note. AA = Antisocial Attitudes; Aggr. = Aggressive Attitudes subscale; A-Est. = Anti-establishment Attitudes subscale; Offend. – Self-reported offending.

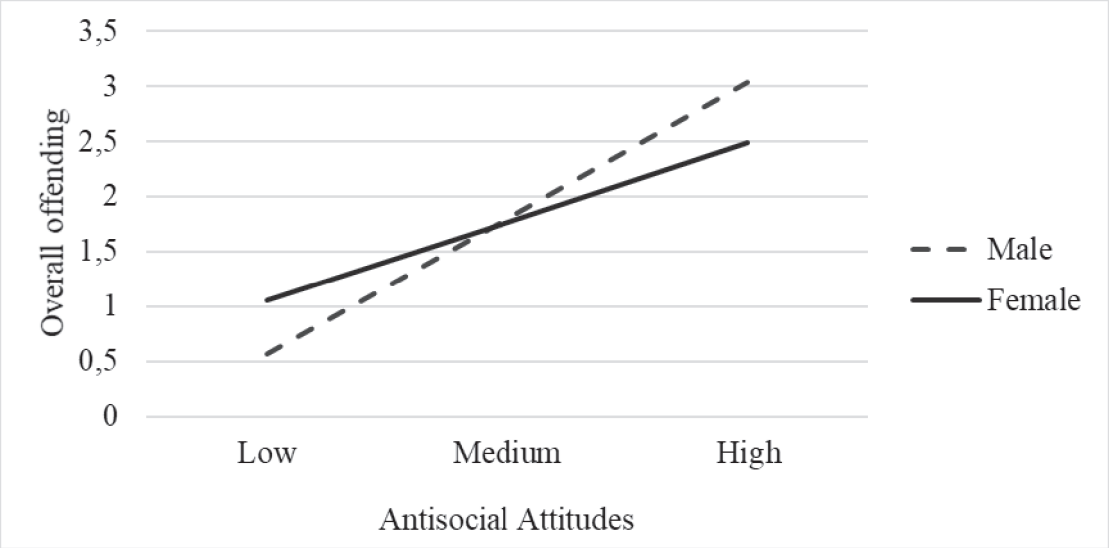

Figure 2 Simple Slope Analysis Chart of Model 1

nificant predictor of non-violent offending for males, but not for females (see Table 3). Figure 3 shows the simple slope analysis of this effect for overall antisocial attitudes.

Finaly, we tested the third hypothesis by carrying out Models 7, 8, and 9: (7) sex moderates the relationship between total antisocial attitudes and violent offending (Model 7); (8) sex moderates the relationship between aggressive attitudes and violent offending (Model 8); and (9) sex moderates the relationship between anti-establishment attitudes and violent offending (Model 9). Model 7 explained 48% of the variance in violent juvenile delinquency (see Table 2). Again, we found overall similar results in each model. As Table 2 suggests, we found a direct effect of antisocial attitudes on violent offending (Model 7: $b = 0.96$, $p < .001$; Model 8: $b = 0.72$, $p < .001$; Model 9: $b = 0.69$, $p < .001$); a null effect of sex on violent offending; and, there was no evidence of an interactional effect. Consequently, these results suggest that sex is not a moderator of the relationship between antisocial attitudes and violent offending (Table 3). Figure 4 illustrates this effect on overall antisocial attitudes.

Discussion

The present study aimed to understand the relationship between antisocial attitudes and offending and, additionally, the moderating effect of sex in this relationship. Over-

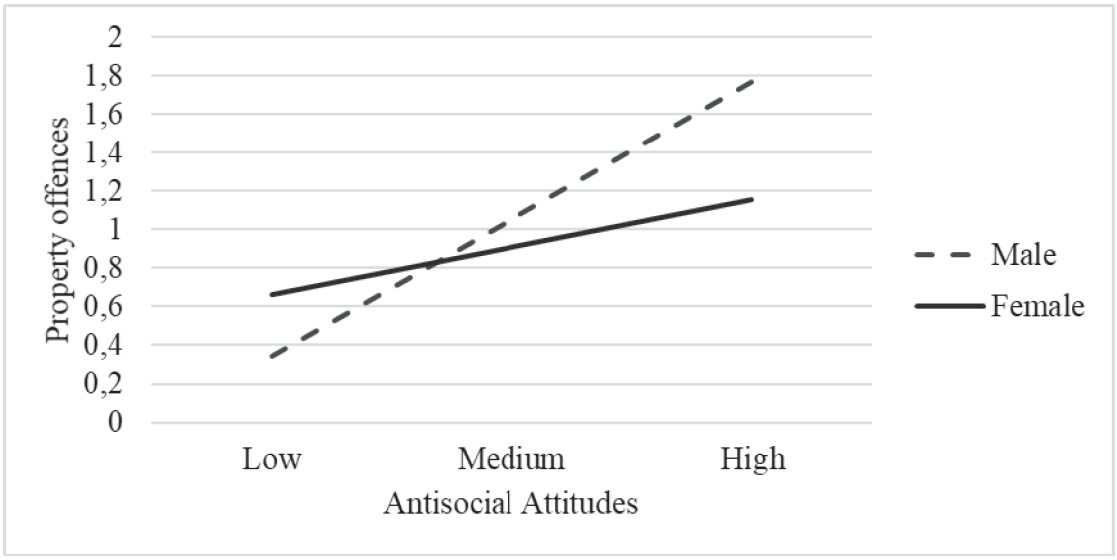

Figure 3 Simple Slope Analysis Chart of Model 4

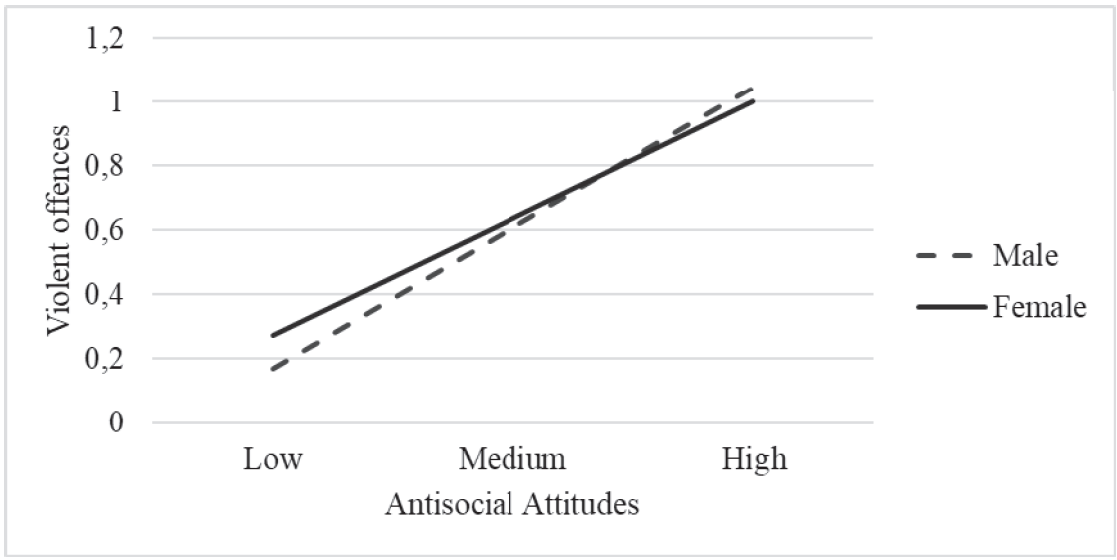

Figure 4 Simple Slope Analysis Chart of Model 7

all, the results were consistent across different types of antisocial attitudes (total, aggressive, and antisystem attitudes). Antisocial attitudes were strong predictors of overall offending, with sex moderating this relationship. However, when examining non-violent and violent offending separately, different patterns emerged. For violent offending, sex did not moderate the relationship, suggesting that antisocial attitudes predict violent offending similarly for males and females. In contrast, antisocial attitudes were stronger predictors of non-violent offending in males, suggesting a sex-specific mechanism.

This study provides a significant contribution to one of the most prominent life-course theories, the ICAP theory, by partly replicating the results found by Farrington and McGee (2017). By examining the predictive power of antisocial attitudes on violent, non-violent, and overall offending, this study enhances our understanding of how these attitudes operate across sexes and offense types.

Regarding violent offending, antisocial attitudes were strong predictors for both males and females, aligning with the ICAP theory. This theory suggests that violent behavior arises from shared underlying risk factors, such as conduct disorders and antisocial cognitive processes (Moffitt et al., 2001). The absence of a moderating effect of sex in this context supports the notion that violent offenders, regardless of sex, may share similar cognitive profiles. Prior research has found comparable levels of antisocial cognitive processing in males and females with conduct disorders, along with shared risk factors such as mental health issues, further explaining this pattern (Mof-

fitt et al., 2001). These findings reinforce the ICAP theory's emphasis on common risk factors driving violent offending.

Conversely, the relationship between antisocial attitudes and non-violent offending revealed notable sex differences, with these attitudes showing stronger predictive power for boys. This divergence challenges the ICAP theory, which does not explicitly account for such variations. Boys' lower levels of reported prosocial attitudes (Lardén et al., 2006) and greater susceptibility to peer influence (Piquero et al., 2005) may explain their higher engagement in non-violent offenses, which are often perceived as less risky or stigmatizing. Additionally, girls may engage in different cognitive processes when considering non-violent offenses, prioritizing relational concerns or cost-benefit analyses over antisocial attitudes, altering how they justify and engage in non-violent offending. Research suggests that for incarcerated females, antisocial cognitive processing may present higher scores (Walters & McCoy, 2007), possibly because female offending is perceived as less socially acceptable.

This study also contributes to the literature on antisystem attitudes. These attitudes were significant predictors of non-violent and overall offending, aligning with prior research demonstrating their influence on youths' perceptions of right and wrong (Farrington, 1995). However, sex differences emerged, with only males showing associations between antisystem attitudes and non-violent offenses. This finding suggests that in communities where antisystem beliefs are strong, boys and girls experience these attitudes differently (Cohn & Modecki, 2007). Girls might face different pressures in these environments, influencing how they view and justify non-violent offenses, or they might prioritize relational concerns or conduct cost-benefit analyses, leading to distinct cognitive pathways to offending (Farrington & Painter, 2004). Future research should further investigate these differences as they directly challenge the ICAP theory's assumption that offending pathways are the same for both sexes. Instead, findings suggest that societal and cultural pressures in communities with strong antisystem beliefs might push boys and girls toward distinct cognitive and behavioral responses. Another possible explanation for sex's moderating role may be that different types of antisocial attitudes play a more important role in female offending, such as antiforeigner and pro-drug attitudes (Cohn & Modecki, 2007; Farrington & Painter, 2004).

Interestingly, while aggressive attitudes are often studied in relation to violent behavior, this study demonstrates their predictive value for overall offending and non-violent offending as well. Aggressive attitudes may reflect broader antisocial cognitive processes, such as self-serving distortions (e.g., blaming others, minimizing harm), which are linked to various offenses (Gomes et al., 2022). These findings address gaps in the literature, as existing research often explores the effect of aggressive attitudes on aggressive behavior rather than overall juvenile offending and non-violent offenses (e.g., Dodge & Coie, 1987; Huesmann, 1998; Huesmann & Guerra, 1997; Huesmann et al., 1992; Zelli et al., 1999). Prior studies have identified antisocial attitudes as one of the strongest predictors of delinquent behavior (Gendreau et al., 1996), ranking among the "Big Four" risk factors alongside a history of previous delinquency, personality traits, and delinquent peers (Bonta & Andrews, 2017). Literature postulates that people with more aggressive attitudes tend to become more violent (Huesmann, 1998). Aggressive attitudes are strongly associated with deviant cognitive processes involved in evaluating and reacting to social situations. These include hostile attribution bias, a tendency to generate aggressive solutions in perceived unfair situations, and a retrospective evaluation of aggressive responses as positive over time (Zelli et al., 1999). Therefore, our findings contribute to addressing this research gap by assessing the predictive power of antisocial attitudes not only on overall offenses but also by distinguishing between violent and non-violent offenses.

Conclusion

In conclusion, this study advances the understanding of aggressive and antisystem attitudes in juvenile delinquency and how their influence varies as a function of participants' sex. While it provides valuable insights, some limitations must be acknowledged. First, the reliance on self-reported measures, despite assurances of anonymity, may cause response biases (Gomes et al., 2018, 2019). Additionally, the cross-sectional design limits causal inferences, highlighting the need for longitudinal research. Another limitation is the focus on specific antisocial attitudes, such as aggressive and antisystem attitudes, which may overlook other relevant factors like pro-drug or anti-foreigner attitudes. The sample's geographical and cultural specificity may also constrain the generalizability of our findings. Moreover, differences in offense prevalence rates may have influenced the measures, potentially exaggerating the strength of male associations (Farrington & Painter, 2004). These factors warrant caution when interpreting the findings.

Despite these limitations, this study lays the groundwork for future research. Longitudinal studies are essential to explore how antisocial attitudes evolve over time and their role in desistance or life-course-persistent offending. Further investigations into the moderating role of sex in the relationship between antisocial attitudes and offending is warranted. Future research should also examine additional types of antisocial attitudes, such as pro-drug or anti-foreigner beliefs, to enhance the understanding of their impact, particularly in female offending. Emerging evidence suggests that females might prioritize different cognitive processes, such as cost-benefit analyses or relational concerns, when engaging in antisocial behavior, contrasting with the stronger predictive power of antisocial attitudes for males (Butler et al., 2015; Cohn & Modecki, 2007). By expanding the scope of research, scholars

can refine theoretical frameworks to capture sex-specific pathways to offending.

Beyond its contributions to academic literature, this study holds significant implications for youth crime prevention and intervention strategies. Since antisocial attitudes strongly predict offending behavior, interventions should prioritize altering these attitudes. Programs tailored for males might focus on addressing aggressive and anti-system attitudes and counteracting peer influences through cognitive-behavioral strategies that challenge antisocial thinking and promote prosocial behavior. For females, interventions should explore the role of pro-drug or anti-authority attitudes and address relational dynamics and fear of social rejection. Notably, the absence of sex differences in violent offending suggests that universal approaches targeting antisocial attitudes and cognitive distortions could effectively reduce violent behaviors across sexes. Early interventions during adolescence are critical in preventing the escalation of criminal behavior into adulthood. These findings underscore the importance of sex-responsive, evidence-based interventions that address different cognitive factors and foster positive developmental trajectories for all youth.

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