Intelligence as a protective factor against offending: A meta-analytic review of prospective longitudinal studies

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ARTICLE INFO

ABSTRACT

Purpose: To synthesize results from major prospective longitudinal studies that investigated the extent to which intelligence may function as a protective factor against offending and violence.
Methods: Results are based on systematic searches of the literature across 18 databases. Papers are included in the meta-analyses if results are based on longitudinal data.
Results: Fifteen longitudinal studies investigate the extent to which an above-average intelligence may function as a protective factor. Meta-analytic results of studies on interactive protective factors suggest that a higher level of intelligence is a factor which can predict low levels of offending differentially within the high-risk (random effects model OR = 2.32; 95% CI: 1.49 – 3.63; p = 0.0001) and the low-risk (random effects model OR = 1.33; 95% CI: 0.88 – 2.01; p = 0.18) groups. A high intelligence level is differentially protective against offending within different levels of risk. In agreement with an interaction effect, the high-risk and low-risk effect sizes were significantly different (mixed effects meta-regression: point estimate = 0.509; SE = 0.175; p = 0.004). Meta-analytic synthesis of studies that looked at risk-based protective factors (i.e. analyses based only on high-risk individuals) is also presented and results are consistent with initial hypotheses.
Conclusions: This methodological demonstration paper confirms the variability in conceptualizations, theoretical approaches and methodological strategies used to investigate the protective effects of intelligence against offending. Intelligence can function as a protective factor for offending. Implications for policy and practice are highlighted.

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Introduction

Low intelligence is a well-known risk factor for criminal behavior, violence and conduct problems (e.g., Ellis & Walsh, 2003; Hirschi & Hindelang, 1977; Ward & Tittle, 1994; West & Farrington, 1973; Wilson & Herrnstein, 1985). Much less however, is known about a potential protective function of above-average intelligence against other risk factors. A few older studies suggest that good intelligence may buffer family and other social risks (Kandel et al., 1988; Lösel & Bliesener, 1994; Stattin, Romelsjo, & Stenbacka, 1997; Werner & Smith, 1982). Other research found a protective function only for specific subgroups or measurements (e.g., McCord & Ensminger, 1997; Stouthamer-Loeber et al., 1993).

Although there are different definitions, dimensional concepts and results on the underlying cognitive components of intelligence (e.g., Gardner, 1999; Sternberg, 2000), a protective function against

criminality is theoretically plausible. For example, intellectual ability can partly compensate for background disadvantage in educational and occupational attainment (Damian, Su, Shanahan, Trautwein, & Roberts, 2015), reduce biases in aggression-prone social information processing (Crick & Dodge, 1994), and indicate executive functions that are relevant for planning and self-control (Raine, 2013). Nevertheless, criminological research on the protective effects of intelligence is still scarce. This is surprising as protective effects of personal and social resources currently attract much interest in the academic community and are certainly relevant for prevention and intervention efforts.

Whereas research on risk factors has a long tradition in studies of antisocial behavior, there has been increased interest in recent years in factors that contribute to desirable behavioral outcomes. Various disciplines have driven this change of perspective, including research on resilience (Rutter, 2012), positive psychology (Seligman & Csikszentmihalyi, 2000), desistance from crime (Kazemian & Farrington, 2015), developmental prevention (Farrington & Welsh, 2007) and offender rehabilitation (Lösel, 2012). Focusing on protective factors and on building resilience is viewed as a more positive approach, and more attractive to

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Table 1
Details of Studies on IQ as a protective factor

Authors (publication date)	Study Name (Country)	Type of High-Risk/ 'Experimental' Group	Type of Comparison Group	Risk Factors (age at Measurement)	Age at Risk Measurement	Age at Protective Factors Measurement	Outcome Measure	Age at Outcome Measurement	Results
Andershed et al. (2016)	Individual Development and Adaptation Study (Orebro Study; Sweden)	Not applicable; analyses on the whole sample of males, with multivariate regression analyses with risk and protective factors as independent variables	Not applicable	Behavioral risk index score (teacher-rated combined score on aggression, concentration difficulties and motor restlessness)	Age 10	IQ measured with intelligence test at age 13 Other protective factors measured, falling within the individual, family and school domain	Official registered convictions of violent offending between ages 12 – 35	Between ages 12 to 35	Less violent males had higher IQ (OR = 0.672) Further analyses with IQ as part of an 'individual domain index score'
Bender et al. (1996)	Bielefeld-Erlangen Study on Resilience (Germany)	66 resilient adolescents (mean age: 15.5) from 27 residential homes with a high-risk load based on a 71-item index	80 deviant (mean age: 15.7) adolescents with a high-risk load based on a 71-item index	Resilient and Deviant adolescents had a similar average risk load (non-significant differences). In the 2-year follow-up Resilient Adolescents (N = 18; Age about 17.5) had scores below the 85th percentile on externalizing problems; Deviant Adolescents (N = 19; Age about 17.7) scored above the 85th percentile in either externalizing problems or on another scale	Not applicable: multiple risks (score index of 71 items) based on a range of life events	At the two-year follow-up, when the adolescents were about 17 – 18 years of age	IQ Level based on the Prufsystem fur Schul und Bildungs-beratung (PBS; Horn, 1969), assessing verbal intelligence, reasoning and technical/spatial intelligence	At the two-year follow-up, when the adolescents were about 17 – 18 years of age	Non significant differences on all three IQ measures for the two groups, shown in Cohen's d Verbal: 0.10 Reasoning: 0.14 Technical/ Spatial: 0.43
Dubow et al. (2016)	Columbia County Longitudinal Study (USA)	Not applicable; the male individuals of the sample (at the last two follow-ups) were divided in violent-non violent and differences in risk and direct protective (promotive) factors across the two groups were investigated	Not applicable		Age 8	IQ measured at Age 8	Adult violence, a composite score based on whether the participant had ever been arrested in adulthood for violence offense (all arrests reported since age 18 were included) and/or whether he was in the upper 25% on the severe self-reported (at ages 30 and 48) physical violence score	Assessed at Ages 30 and 48 (for self-reported physical violence) and Ages 18 onwards for official criminal records	No significant difference in IQ between violent and non-violent males (t = 1.57, p = ns). Finding not included in the meta-analysis due to biased results: at the age 48 follow-up, there was an attrition of 39% of the original sample which was differential for age 8 IQ (i.e. the re-interviewed participants had a significantly lower IQ compared to the not re-interviewed participants).
Farrington et al. (2016)	Cambridge Study in Delinquent Development (England)	Various high-risk categories created based on the worst quarter (the risk end) versus the remainder. Within each high-risk category, percent	Various low risk categories created based on the 'best quarter' (the promotive end) versus the remainder. Within each low-risk category,	Poor child rearing, low school achievement, high hyperactivity and other risk factors measured at age 8 – 10	Age 8 – 10	Non-verbal IQ measured using Raven's Progressive Matrices Test at age 8 – 10 Verbal IQ, based on verbal comprehension	Convictions from age 10 – 18 based on official data	Ages 10 to 18 inclusive	For males with high-risk (i.e. poor child rearing), 13.3% of high intelligence were convicted, compared to 40.3% of low intelligence.