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The lasting impact of youth bullying exposure on adult labor market outcomes: An inter-disciplinary review of the literature

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Higher direct and indirect exposure to bullying has been linked to long-term increases in healthcare costs, worse mental health, and poorer social relationships as well as a reduction in human capital accumulation and economic productivity. Consequently, preventing and mitigating the long-lasting negative effects of bullying has become a worldwide challenge for school and health policies. This paper aims to review the evidence supporting an effect on early-life bullying victimization on adult socioeconomic outcomes and develop an integrative framework for understanding these effects that encompasses (1) how bullying processes emerge and are sustained during childhood and adolescence; (2) how they affect labor opportunities in adulthood; (3) the mediating role of skill, social capital, identity, and mental health; and (4) how social structures as well as individual characteristics determined early in life (e.g., innate capacities, vulnerability and susceptibility) may operate as moderators or potential confounders. Our framework draws from theoretical and empirical work in education and labor economics as well as in clinical and developmental psychology. Our integration and synthesis on how the processes relate over time provides researchers, practitioners, and policymakers concrete directions for future research and support evidence-based arguments in favor of continued development and improvement of antibullying programs by both schools and governments.

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Abstract

Higher direct and indirect exposure to bullying has been linked to long-term increases in healthcare costs, worse mental health, and poorer social relationships as well as a reduction in human capital accumulation and economic productivity. Consequently, preventing and mitigating the long-lasting negative effects of bullying has become a worldwide challenge for school and health policies. This paper aims to review the evidence supporting an effect on early-life bullying victimization on adult socioeconomic outcomes and develop an integrative framework for understanding these effects that encompasses (1) how bullying processes emerge and are sustained during childhood and adolescence; (2) how they affect labor opportunities in adulthood; (3) the mediating role of skill, social capital, identity, and mental health; and (4) how social structures as well as individual characteristics determined early in life (e.g., innate capacities, vulnerability and susceptibility) may operate as moderators or potential confounders. Our framework draws from theoretical and empirical work in education and labor economics as well as in clinical and developmental psychology. Our integration and synthesis on how the processes relate over time provides researchers, practitioners, and policymakers concrete directions for future research and support evidence-based arguments in favor of continued development and improvement of antibullying programs by both schools and governments.

Public Significance Statement

Bullying exposure during childhood and adolescence may have long lasting effects on labor market outcomes as adults via hindering the formation of human capital, eroding social capital, altering identity formation processes, and worsening mental health. This article explains how bullying processes are formed and sustained as well as how bullying exposure affects labor market outcomes via reducing skills accumulation, social networks, self-worth, altering of stress response system and epigenetic modifications. The findings support the implementation of policies and interventions aimed at improving youth empathy, social relationships, and school climates as important foundations for the development of skills and mental wellbeing necessary to achieve higher economic self-sufficiency and success.

Keywords: Bullying, human capital, social capital, identity development, mental health, labor market

I. Introduction

Bullying affects about a third of children and adolescents posing a significant public health and education challenge (Modecki et al., 2014). Peer victimization in childhood and adolescence is associated with mental health problems in adulthood (Arseneault, 2017; Evans-Lacko et al., 2017; Takizawa et al., 2014), reduced human capital accumulation, and lower economic productivity (Ammermueller, 2012; Brimblecombe et al., 2018; Brown & Taylor, 2008; Gorman et al., 2021). Moreover, these negative consequences may also extend to uninvolved youth via classroom disruptions that alter teachers' pedagogical practices and require management interventions (Carrell et al., 2018; Epple & Romano, 2011). Consequently, multiple cost-benefit analyses show high parental concern and large financial benefits from anti-bullying interventions. In Sweden, a study shows that caregivers are willing to pay around US$120,000 to prevent a single case of bullying (Persson & Svensson, 2013). In the United States (US), the annual net benefit of antibullying programs has been estimated to be around US$3.5 billion (Agee & Crocker, 2016), and in the Netherlands a cost-benefit analysis shows that for every dollar invested in an effective antibullying program, the expected return in the long term is between 4.6 and 7.7 dollars (Huitsing et al., 2020).

Bullying and poor peer relationships are complex social phenomena that have been conceptualized, researched, and discussed across the social and biopsychology sciences with the goal of reducing its prevalence and mitigating negative consequences. This cross-disciplinary review integrates research from economics, education, and psychology to develop a framework explaining how bullying victimization affects adult labor market outcomes. Specifically, we: (1) characterize how bullying processes emerge and persist during childhood and adolescence, (2)

review and summarize the literature connecting early-life bullying victimization to worse labor market outcomes in adulthood, (3) describe putative pathways through diminished skill formation, social capital, self-concept, and mental health, and (4) examine how individual characteristics and social structures – including vulnerabilities, developmental stage, and societal stereotypes – may moderate these processes or confound the causal links. Our synthesis provides researchers, practitioners, and policymakers with concrete directions for future research and evidence-based rationale for antibullying programs at school and government levels.

II. Conceptualizations of bullying processes

According to the Merriam-Webster dictionary, the first known reference to bullying dates back to 1742 to describe the "abuse and mistreatment of someone vulnerable by someone stronger." Until recently, the essence of this definition had not changed in the social sciences and public policy (Menesini & Salmivalli, 2017; Olweus, 1973). The most influential definitions, including the one provided by the Center for Disease Control in the US, consider bullying as a specific type of peer-aggression that is intentional or goal-directed, repetitive, harmful, unwanted, and characterized by a power imbalance between aggressors and victims (Gladden et al., 2014; Olweus, 1994; Volk et al., 2014). Definitions like this emphasize individuals' agency without much consideration of the contexts that regulate and restrict such agency (Horton & Forsberg, 2015). In an effort to include structural factors, UNESCO and the *World Anti-Bullying Forum* formed a working group that proposed a revised definition in 2021, which contends that bullying occurs within a social network and that the power imbalances between bullies and targets are linked to norms structuring relationships in that network. These norms enable or inhibit the onset and maintenance of peer victimization processes (UNESCO and WABF, 2021).

Two paradigms dominate theoretical perspectives. The first centers on factors external to the network – characterized by one group of students with behavioral problems that bully others, usually outside their friendship loop, and another group of victims that are unable to defend themselves because they lack social abilities or have other weaknesses that make them prone to peer-aggressions. Supporting evidence demonstrates that individual characteristics may predict victimization risk. In a study from South Korea, skills such as perseverance, self-control, and self-esteem protect against victimization; a one standard deviation increase in these skills reduces the probability of peer victimization by 6% (Sarzosa & Urzúa, 2021). Similarly, quality of parent-child attachment, previous exposure to violence, history of abuse or inconsistent parenting, students' perceptions of their school environment as negative and unsupportive, and appraisals of threat or self-blame have all been linked to risk of bullying victimization and perpetration (Akers & Jennings, 2015; Barchia & Bussey, 2010; Guedes et al., 2018; Knous-Westfall et al., 2012; Walden & Beran, 2010).

The second paradigm conceptualizes bullying as a socially and culturally complex phenomenon in which power differentials reflect institution hierarchies rather than individual traits, and where roles (bully, victim, bystander) are fluid rather than fixed (Horton & Forsberg, 2015; Schott, 2014; Yoneyama, 2015). This latter framework proposes that in-group/out-group dynamics, needs for belonging, and fear of social exclusion drive the establishment of social norms that protect conforming youth while placing non-conforming youth at risk of rejection. Supporting evidence demonstrates that structural factors systematically predict bullying prevalence. For example, higher prevalence is observed in regions with depressed economic conditions (Chaux et al., 2009), and high income and academic inequality (Contreras et al., 2015). Societal structures that privilege certain identities also create conditions for victimization

– heteronormative norms position non-conforming gender expressions as deviant (Wei & Chen, 2012), while socially devalued characteristics related to race, ethnicity, disability, weight, and social class also systematically increase exposure risk (Earnshaw et al., 2018; Goodboy et al., 2016).

Drawing from these frameworks, extensive ethnographic work has documented that bullying processes originate in social transactions to gain and maintain status in their networks (Horton, 2011; Thornberg & Delby, 2019). Those who become targets are usually perceived as misfits of the culture defined by peers, as non-compliers of important *taken-for-granted* norms who deviate in valued forms such as having different clothes, appearance, skills, personality, behavior, or way of speaking (Cranham & Carroll, 2003; Forsberg, 2017; Thornberg, 2011). Out of the norm youth are typically labelled as different in a negative way. This *differentness* may become the dominant feature of the target's social identity, and the negative reputation can spread further within the community to the point that even those who do not actively participate in bullying may reject and isolate the target because of pressure to conform to the social norms and to prevent becoming a target themselves (Hamarus & Kaikkonen, 2008).

A significant share of the bullying processes is persistent and maintained via enabling behaviors in aggressors and identity internalization in targets. On the one hand, the attacks are sustained by social-cognitive distortions in aggressors that deactivate their moral self-sanctions, which leads them to excuse their behavior, minimize the consequences, and blame it on characteristics of the targets (Killer et al., 2019; Pozzoli et al., 2012; Thornberg et al., 2023). On the other hand, stigmatized subjects begin to internalize the external attacks, altering processes of identity formation and self-image that can last for years, even after the peer victimization ends (Merten, 1996; Thornberg, 2015; Thornberg et al., 2013).

III. Youth bullying exposure and labor market outcomes in adulthood

Although growing, longitudinal evidence linking bullying victimization during childhood and adolescence to adult labor market outcomes remains limited, with most studies originating in high-income countries. This section organizes findings by outcome type (i.e., employment and earnings), progressing from cross-sectional studies to prospective and quasi-experimental designs within each category (Table 1 summarizes the 18 empirical studies reviewed: five focused on employment, three on earnings, and ten on both outcomes).

III.A. Labor force participation and employment

Early cross-sectional work with retrospective measures of bullying provided suggestive evidence that bullying exposure during childhood and adolescence is associated with lower labor force participation, greater job instability, and transitions into informal work. For instance, a small-sample cross-sectional Finnish study of long-term unemployed adults in job-training programs found a substantially higher share of frequent adolescent victimization than in the general population (29% vs 8%; Varhama & Björkqvist, 2005). A retrospective study from Greece suggested these adverse effects on labor market participation and employment concentrate in men, immigrants, sexual minorities, and those with worse mental health (Drydakis, 2014). Additionally, a third retrospective study based on 328 US outpatients reported that youth bullying exposure was also associated with job termination (51.4% vs. 30.3%), working a greater number of jobs (6.05 vs. 4.74), and being paid "under the table" (37.6% vs. 23.7%) (Sansone et al., 2013).

Following these initial efforts, researchers leveraged decades-long panels such as the British National Child Development Study (NCDS), which follows all children born during one

week in March 1958 and provides the longest-running evidence on labor market outcomes. Using prospectively measured bullying at ages 7 and 11, NCDS studies have shown higher midlife non-employment among those frequently bullied in childhood (at age 50; men odds Ratio [OR] = 1.49, women OR = 1.39; Brimblecombe et al., 2018), with associations strengthening over time (not having paid job: −4.8 percentage points [pp] at age 33 and −6.9 pp at 50; Blanchflower & Bryson, 2024), and concentrating in men (being unemployed: increase of 2.6 pp for men at age 50, but no significant differences for women; Takizawa et al., 2014).

More recent evidence from the Longitudinal Study of Young People in England (LSYPE; birth cohort 1989-90; tracking 15,000 children from ages 13-25) shows a similar pattern. Bullying victimization between ages 13-16 increases the probability of not being employed at age 25 by roughly 3 percentage points. Effects concentrate on high-intensity exposure, especially when bullying involved threats and physical violence (rather than name-calling or social exclusion), while low-intensity or single-type exposure shows little to no effect (Gorman et al., 2021). Moreover, these associations extend to inactivity (not in education, employment, or training: "NEET" status) even after adjusting for self-esteem, locus of control, and other psychosocial factors (OR = 1.75; Tayfur et al., 2022).

Prospective evidence from other European countries is aligned with the UK. In a Norwegian nationwide cohort of 11,874 youth surveyed at age 15 and linked to administrative registers eight years later, exposure to bullying and other forms of violence predicted lower work participation at age 23 (OR = 1.51). The relationship showed a dose–response pattern: decreased participation as exposures increased, even after adjusting for relevant covariates (Strøm et al., 2013). Similarly, Dutch evidence from the TRacking Adolescents' Individual Lives Survey (TRAILS) indicates labor market detachment at age 22 among those who experienced bullying

victimization before age 16 (24.8% of inactive group had been bullied compared to around 5% of workers), with mental-health problems and school dropout as potential mediators (de Vries et al., 2023).

In the US context, a Great Smoky Mountains Study (rural North Carolina) shows that bullying victimization at ages 9-16 nearly doubles the odds of job dismissal (OR = 1.99) and more than doubles the odds of quitting multiple jobs without financial preparations (OR = 2.33) at ages 19-26. Bully-victims faced even more severe employment instability, with 2.43 times higher odds of job dismissal and 5.44 times higher odds of quitting multiple jobs – associations that remained significant after adjusting for childhood family hardship and psychiatric disorders (Wolke et al., 2013). In a study based on the US National Longitudinal Survey of Youth 1997 (NLSY97; 1980–84 birth cohorts), individuals who reported repeated bullying victimization before age 18 showed no meaningful differences in labor-force participation or unemployment (Mukerjee, 2018), but worked fewer annual hours at several ages (e.g., about −87 hours at 30, −55 hours at 35, −67 hours at 40), had shorter job tenure (about 34.5 fewer weeks at age 30), sorted into less complex occupations with lower abstract-task content, were less likely to be in professional roles, and reported lower job satisfaction (Summerfield, 2024).

In other lower- and middle-income countries, the contrast between employability and job quality is even sharper. Using Young Lives data from India, Peru, Vietnam, and Ethiopia – and instrumenting peer physical victimization at age 15 with lagged local conviction rates – Hasnat and Fakir (2023) estimate that by age 22 targets are more likely to be currently employed (+11.7 pp) but less likely to sustain employment beyond three months (−16.5 pp). Over a typical year they supply more labor (log hours = +0.871; log days = +0.651; log months = +1.199) yet earn less (log earnings = −0.222). This pattern is consistent with targets not pursuing tertiary

education to sort into low-paying jobs in agriculture, leading to lower wages despite greater labor supply. Taken together, these results underscore the importance of assessing employability as well as earnings and job quality when evaluating the labor-market consequences of bullying.

III.B. Earnings, income, and wealth

Research examining the associations between bullying exposure and earnings varies in design and context. Among simpler designs, two cross-sectional studies using retrospective reports suggest that bullying victimization depresses adult income. In a community cohort from Ontario, Canada, peer victimization before age 16 was unrelated to employment, but total household income fell by 7% for each 1-point increase on a 10-point peer victimization composite (Day et al., 2017). Complementing this, a nationally representative retrospective survey from Greece links higher victimization to lower labor force participation and employment, alongside a wage penalty of about −2% per unit on a 17-point frequency-intensity index, with larger losses for men, immigrants, sexual minorities, unmarried people, and those with poorer mental health (Drydakis, 2014).

Prospective evidence has been generated using many of the same longitudinal cohorts noted above, with much of the work based on the UK NCDS. Brown and Taylor (2008) report earnings penalties age ages 23 (10-12%) and 33 (6-9%) for those frequently bullied at ages 7 or 11, though differences dissipated by age 43. Extending this research, Ammermueller (2012) shows that when adding controls for reading proficiency, physical attractiveness, and mental health symptoms, an estimated 8% earnings penalty persisted at age 33. At age 50, Brimblecombe et al. (2018) find significant earnings losses for women (7.6%) but not for men, alongside lower odds of owner-occupation (men OR 0.74; women OR = 0.76, borderline). By contrast, Takizawa et al. (2014) report non-significant weekly-pay differences at 50 for both men

and women. Finally, using more recent data from England, Gorman et al. (2021) estimate that any bullying between ages 13-16 is associated with about 1% lower income at 25, with violent bullying showing a larger 4% reduction. Overall, across these UK studies, the earnings penalties are largest in early adulthood, attenuate into midlife, and tend to be stronger when bullying is measured at age 11 than at age 7.

The US longitudinal evidence parallels the UK on earning penalties and adds that penalties grow with severity and chronicity, while also revealing complex heterogeneity by timing and sex. Using the same NLSY97 cohort, two designs converge on income losses but diverge on who is most affected. At age 24, Mukerjee (2018) finds sizable income losses concentrated among those bullied as teenagers and men (−23% for teen-bullied men; −16% for teen-bullied women; pre-12 exposure is not significant). Following the cohort into their 30s, Summerfield (2024) reports persistent wage penalties (around 15% at age 30 and 10% at 35), generally larger for women (roughly 8% for men and 16% for women between ages 30-40) and for adolescent exposure (16% for ages 12-18; 11% before 12). These results are robust to household and sibling fixed effects and are partially mediated by education and health.

Conway et al. (2024) use the US Panel Study of Income Dynamics to provide suggestive evidence that income at age 25 is lower after early-adolescence bullying (ages 9-14) but not late-adolescence exposure (ages 14-18). They also find sex-by-victimization-type interactions: for early-adolescent females, social exclusion is associated with a stronger penalty, whereas for early-adolescent males, robbery/things taken predicts larger losses. Relatedly, Wolke et al. (2013), using the Great Smoky Mountains Study, link bullying at ages 9–16 to poorer financial standing at ages 19–26 (−0.21 in a z-standardized index; mean = 0, standard deviation = 1), especially for bully-victims (−0.43) and for chronic exposure (more than two waves: −0.42)

compared to single-episode exposure (near zero, not significant). This pattern converges with NLSY97 evidence showing that cumulative victimization (0-7 index including bullying and other exposures such as sex abuse) predicts slower growth in both occupational prestige and income across ages 18–28 (Fernandez et al., 2015).

While mounting evidence shows that harms are largest for bully-victims, chronic victims, and poly-victims, related work indicates that costs also spill over to uninvolved peers. Using Florida administrative data, Carrell et al. (2018) instrument classroom disruption from aggression-prone peers with the percentage of classmates exposed to domestic violence. They find that having one additional problematic peer in grades 3–5 reduces earnings at age 26 by 3–4%. These results imply that even students not directly targeted by bullying can face lasting economic penalties from adverse peer climates. Mitigating long-run income losses therefore requires both individual-focused prevention and supports as well as system-level efforts to improve school climate and culture.

Table 1: Summary of the empirical evidence

Authors	Country cohort	Age of bullying exposure	Bullying victimization variable	Age of labor market outcome	Labor market outcome	Sample size	Study design	Main effects
Panel A: Labor participation and employment outcomes								
Sansone, Leung & Wiederman (2013)	USA, internal medicine outpatients	Childhood (no specific ages)	Self-reported ever bullied (yes/no); prevalence bullied 43.3%	Since age 18	Number full-time jobs; ever paid "under the table"; ever fired; time employed (self-report)	N=328	Cross-sectional survey (retrospective); clinic convenience sample; group comparisons (ANOVA/χ^2)	Employment: Greater number of different jobs ($p<.05$), higher odds of under-the-table pay ($p<.05$), and higher odds of being fired ($p<.05$); no difference in time employed; no regression CIs reported
Varhama & Björkqvist (2005)	Finland, Long-term unemployed trainees vs national school cohort	School grades 1–9; Ages 7–16	Self-reported school bullying as more than once a week during adolescence; prevalence among long-term unemployed = 29% vs ~8% in national pupils	Age 42	Long-term unemployment status: comparison is bullying prevalence relative to national student benchmark	Case sample N=68; national reference N=53,394	Cross-sectional case–comparison; χ^2 test of proportions	Among long-term unemployed, 29% reported being bullied vs ~8% nationally; difference $\chi^2=59.83$, $p<.001$
Strøm, Thoresen, Wentzel-Larsen, Hjemdal, Lien & Dyb (2013)	Norway, Youth Studies school survey linked to national registries	Age 15	Self-reported bullying at/around school in past 12 months; prevalence: bullied 8.3% (one-exposure group); unexposed 69.9%	Age 23	Work participation (registry)	Analytic cohort N=11,874 (nationwide, five counties)	Longitudinal cohort with registry linkage; proportional-odds ordinal logistic regressions; adjust sociodemographic; mediation test via high school completion	Lower work participation: Odds Ratio (OR) =1.51 (95% CI 1.27–1.79); effects reduce but remind significant after adjusting for covariates and mediator
Tayfur, Prior, Roy, Maciver, Irvine Fitzpatrick & Forsyth (2022)	England, Next Steps / LSYPE	Age 15–16	Self-reported "any bullying since cohort start" (binary); reporter: youth; intensity not available; prevalence not reported in main tables	Age 25–26	No Education, Employment, or Training (NEET) status (binary); average NEET prevalence 12.4% at 25–26; youth self-reports	N=1,849 to 2,224 (across specifications)	Longitudinal cohort; weighted logistic regression adjusting sex, ethnicity, SES, caring responsibility, family composition; multiple imputation as sensitivity	NEET: Adjusted OR for bullied vs not bullied ≈ 1.75 (95% CI 1.11–2.78)
Blanchflower & Bryson (2024)	UK, NCDS	Ages 7 & 11	Mother-reported bullying at school, frequency; prevalence: age 7 ≈ 30% sometimes, 5% frequently; age 11 ≈ 21% sometimes, 4% frequently	Age 23–55	Being in paid work (binary, self-report at each sweep)	N ≈ 7,738–10,960 (declines with age)	OLS linear probability models by sweep; controls include sex, region, BSAG at 7, IQ at 11	Being bullied at 11 predicts a lower probability of paid work across adulthood: age 33 (bullied vs. never) −3.9 percentage points (sometimes), −4.8 pp (frequently); age 50, −6.9 pp (frequently); age 55, −6.3 pp (frequently).
Panel B: Earnings, income, and wealth outcomes								
Brown & Taylor (2008)	UK, NCDS	Ages 7 & 11	Mother-reported bullying frequency at 7 and 11; prevalence at 7 ≈ sometimes 29–31%, frequently 5–6%; at 11 ≈ sometimes 17–23%, frequently 3–4%	Age 23, 33, and 42	Log real wage (employees; £, semi-log); sample means by bullying status reported (Table 1)	N = 3,971 employees	OLS Mincer wage with rich controls (education, experience, occupation. industry, and firm size); sample-selection correction via Heckman first stage	Earnings: at age 23, one-point increase in bullying index associated with −0.0305 (t=3.23) at age 7; −0.0283 (t=2.77) at age 11. Authors note larger effects at 33 (~−5.1% at 7; ~−4.7% at 11) and no effect by 42 (attenuation)
Ammermueller (2012)	UK, NCDS	Age 7 & 11	Mother-reported bullying; used as bullied-at-all vs not; prevalence ≈34% (age 7), 23% (age 11)	Age 33	logarithm of gross weekly earnings; self-report	N = 697 employees	Longitudinal; OLS with stepwise controls: (i) labor participation; (ii) Mincer controls; (iii) test scores; (iv) appearance & non-cognitive	Earnings: −0.15 log points (SE 0.05) with participation controls; attenuates to −0.12/−0.10 and becomes non-significant once education, prior scores, appearance & non-cognitive added

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Conway et al. (2024)	USA, PSID	Ages 9–14 and 14–18	Youth self-reports of being left out, picked on, things taken, hit; plus Peer Bullying Scale (α≈0.76). Prevalences: left out 26.4%, picked on 49.1%, things taken 8.5%, hit 12.2%; Peer Bullying Scale mean 1.5.	Age 25	Labor income (annual $, continuous). Mean overall ≈$31,225; males ≈$35,615; females ≈$27,685; self-reported.	N = 525	Longitudinal cohort; multivariable OLS with probability weights, clustering, step-down covariate selection; models stratified by gender; timing tested	Ages 9–14: Income at 25 is lower for females mainly for social exclusion (~$6k–$13k), and for males mainly for robbery ("things taken"; ~$15k–$20k). Ages 14–18: The composite scale are non-significant
Panel C: Employment- and earnings-related outcomes								
de Vries, Arends, Oldehinkel & Bültmann (2023)	Netherlands, TRAILS	Ages 0–16	Bullying victimization (binary, ages 0–16) among 14 AEs across five domains; reporter mostly parent, except bullying/peer rejection/abuse from youth; bullying prevalence overall 7.1%	Age 22	Labor-market outcome includes contract type, hours worked, and monthly income; Latent class analysis leads to four groups: students with side jobs (41.2%), early workers (27.1%), non-working students (25.3%), inactive individuals (5.6%)	N=1,524	Prospective cohort; Latent class analysis of labor market participation and employment conditions; pairwise comparisons of adverse experiences exposure across classes; adjusts for parental education	Bullying victimization higher in the inactive group: 24.8% vs 4.8% (students or side jobs), 7.4% (early workers), 6.2% (non-working students); Association between bullying victimization and (i) inactive: +0.60 (SE 0.17); (ii) students with a side job: −0.32 (0.08); (iii) early workers: −0.11 (0.09); (iv) non-working students: −0.18 (0.11)
Day et al. (2017)	Ontario, Canada: Community sample	Before age 16	Two CEVQ items (verbal & physical victimization), each 1–5; summed 10-point composite; reporters: self at 22–26; ELBW mean 5.17, NBW mean 4.49	Ages 29–36	Total household income (annual CAD, self-report); NBW mean ≈$78,148; ELBW mean ≈$54,451	N = 189	Longitudinal matched cohort; OLS/Logit with covariate adjustment (sex, familial SES, family functioning, childhood CBCL)	Earnings and combined sample: −$4,578 per 1-point increase (p=.005), Employment (past year): non-significant after adjustment
Mukerjee (2018)	USA, NLSY97	Before 12 and 12–18	Ever "repeated bullying" (two dichotomies: pre-12, teen); reporter: self; intensity not available (ever vs never)	Ages 23–27	Annual individual total income (USD, self-report, 2006); plus employment indicators (any week unemployed; weeks unemployed)	N = 1,937	Longitudinal cohort; OLS earnings models with controls for education, experience, health, marital, SES, region, occupation dummies; Propensity Score Matching stratified by sex and timing	Earnings: Teen-bullied males earn about −23% (preferred specification); females: teen-bullied−15.9%; pre-12 bullying: non-significant for both sexes. Employment: no significant differences for any unemployment or weeks unemployed.
Summerfield (2024)	USA, NLSY97	Before 12 and 12–18	Self-reported repeated bullying; prevalence ≈26% ever before 18	Ages 19–40	Log annual earnings; log hourly wage; annual hours; labor-force participation; job satisfaction (1–5); job tenure (weeks); task complexity (abstract index)	N = 6,259	Longitudinal cohort; OLS with rich early-life covariates and local unemployment; Gelbach decompositions; sibling (household) fixed-effects (FE) robustness	Earnings and wages: OLS penalties ≈ −10% to −20% (annual) and −5% to −16% (hourly) across ages; Sibling-FE penalties ≈ −0.147 at age 30 (p<.05), −0.107 at 35 (p<.10). Employment: Labor force participation are null overall; Hours worked, tenure, job satisfaction, task complexity are lower for victims.
Drydakis (2014)	Greece, GBS	Up to age 18	Bullying Questionnaire; frequency × intensity index (17 levels). Mean index=1.25 (SD=2.96); 23.5% bullied more than "rarely"	Ages 18–65 (mean 34.6)	LFP (binary; 93.2% participants), Employment (binary; 78.1% employed), Hourly wage (ln; mean €7.90); all self-reported	N = 4,934 to 6,317 (varies by outcome)	Cross-sectional retrospective survey; Probit (LFP), Bivariate Probit with selection (Employment), Heckman selection (ln wage); extensive covariates including Big Five, depression, human capital	Employment: bullying index marginal effect −0.031 pp, 95% CI [−0.045, −0.017]; LFP: −0.040, [−0.052, −0.028] pp. Wages (ln): −0.019 [−0.029, −0.009] (≈−1.9%). One-SD increase in bullying ≈ −3.3 pp employment, −4.1 pp LFP, −2.1% wage

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Brimblecombe et al. (2018)	UK, NCDS	Age 7 & 11	Parent-reported bullying at 7 & 11; combined three-level intensity (never / occasionally / frequently)	Age 50	Employment status; net weekly earnings (employees only); homeownership; savings (no-to-low / low-to-median / ≥median)	N = 7,323 to 9,222 (varies by outcome)	Longitudinal cohort; logistic & two-part GLM with robust SEs; inverse-probability weights for attrition; controls for childhood confounders; adult covariates at 33 (partnership, education, psychological distress) as potential mediators	Women, if frequently bullied: earnings −£22.74/week (95% CI −£42.05, −£3.43); unemployed/inactive 1.39 (0.94–2.06); not owner-occupier OR 0.76 (0.57–1.01). Men, if frequently bullied: unemployed/inactive OR 1.49 (1.04–2.13); earnings n.s.; not owner-occupier OR 0.74 (0.56–0.97)
Gorman et al. (2021)	England, Next Steps / LSYPE	Ages 13–16	Self- and parent-reported bullying: five types (name-calling, exclusion, extortion, threats, physical) with 6 frequency bands across 3 waves; binary "any bullying," continuous factor score, and 9-category multivalued treatment	Age 25	ln(weekly income); Not employed (includes out of labor force). Mean weekly income ≈ £303	N = 6,400	Longitudinal cohort; OLS with school fixed effects and rich baseline covariates; Propensity Score Matching (PSM); Inverse Probability–Weighted Regression Adjustment (IPWRA) for multivalued treatments	OLS (preferred): ln(income) −0.010, 95% CI [−0.016, −0.004]; Not employed +0.028 [0.014, 0.042]; PSM: ln(income) −0.017 [−0.029, −0.005]; unemployed +0.035 [+0.014, +0.056]. IPWRA: ∼−4% [−6.8%, −1.0%] income only at high-intensity
Wolke et al. (2013)	USA — Great Smoky Mountains Study	Ages 9–16	Child & parent CAPA interviews; role-based groups: victim only, bully only, bully-victim; chronicity = bullied at ≥2 waves	Ages 19, 21, and 24–26 (M≈25)	Wealth/financial-educational composite z-score, including poverty, job dismissal, quitting multiple jobs, education	Childhood N=1,420; adult follow-up N=1,273	Generalized Estimating Equations regressions; adjusted for childhood family hardships (SES, instability, dysfunction, maltreatment) and psychiatric diagnoses (anxiety, depression, disruptive, substance abuse)	Wealth: Victim (vs. uninvolved) β=−0.2195% CI [−0.41, −0.01]; Bully-victim β=−0.43 [−0.78, −0.08]. Chronic victims β=−0.42 [−0.83, −0.01] Single-time-victims n.s. Additional results show dismissal from job—victims OR 1.99 [1.23–3.21]; Quitting multiple jobs—victims 2.33 [1.28–4.26]
Takizawa, Maughan & Arseneault (2014)	UK, NCDS	Ages 7 & 11	Parent-reported bullying at 7 & 11; three-level composite (never / occasionally / frequently)	Age 50	Employment (unemployed vs employed; among those in the labor market); net weekly pay (£) for employees	N men = 3,488; M women = 3,379	Prospective cohort; weighted regressions with robust standard errors; models adjusted for childhood IQ, parental social class, parental involvement, mental health problems	Employment: Men frequently bullied show higher unemployment prevalence at 50 (5.7% vs 3.1% never). Women: n.s. Earnings: Men frequently bullied: β = −£27.2/week 95% CI [−£59.3, £4.9]; Women: β = −£10.3**, [−£27.5, £6.9]
Hasnat & Fakir (2023)	India, Peru, Vietnam, Ethiopia, Young Lives older cohort	Age 15	Physical abuse from peer bullying (binary: any "friends beat/hit/victimize/physically harass me" or "physically hurt by a special friend"); reporter: youth; prevalence ≈18% at 15	Age 22	Currently employed; employed more than 3 months past year; employed 12 months; log annual earnings; log working hours, days, and months past year	N=1,880-2,955 (varies by outcome)	2SLS using lagged (7-year) local adult criminal conviction rate as instrument; controls for covariates; country FE and cluster FE	Currently employed: +0.117 [+0.035, +0.199]. Employed for more than 3 months: −0.165 [−0.241, −0.089]. Employed 12 months: −0.002 [−0.122, +0.118]. log(earnings): −0.222 [−0.473, +0.029] (≈ −20% point estimate; 10% level). log(hours worked): +0.871 [+0.385, +1.357]. log(days): +0.651 [+0.302, +1.000]. log(months): +1.199 [+0.143, +2.255].

LSYPE: Longitudinal Study of Young People in England; NCDS: National Child Development Study; GBS: Greek Behavioural Study; TRAILS: TRacking Adolescents' Individual Lives Survey; PSID: Panel Study of Income Dynamics; n.s.: non-significant; CBCL: Child Behavior Checklist; 2SLS: Two-Stage Least Squares

IV. How bullying victimization affects labor market outcomes: An integrative framework

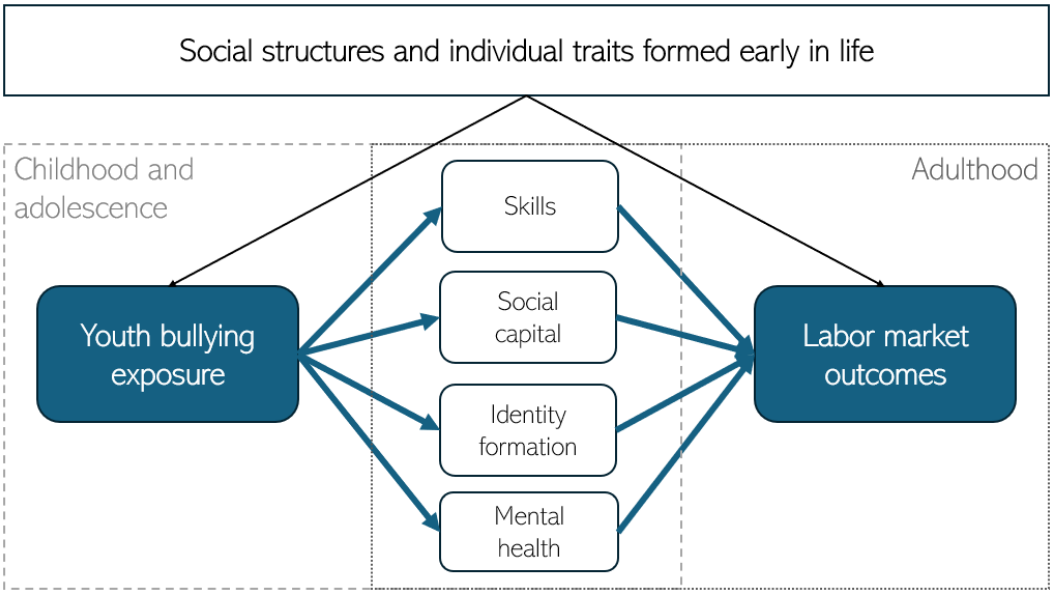
To explain how youth bullying victimization leads to worse labor market outcomes in adulthood, we integrate perspectives from labor economics, developmental psychology, ethnography, and education research (see Figure 1). We conceptualize bullying as a chronic interpersonal stressor that can depress adult outcomes through four pathways. First, it may hamper accumulation of productivity-enhancing skills such as literacy, arithmetic reasoning, self-regulation, perseverance, and sociability (i.e., human capital theory). Second, it could shrink current and future social networks that channel information, referrals, and early job matches (i.e., social capital theory). Third, it might alter identity formation processes, as targeted youth may internalize external attacks to their identity, lowering their self-concept and self-esteem for years, even after peer victimization ends (i.e., grounded theory of bullying processes by Thornberg, 2018; Thornberg et al., 2013). Fourth, it could biologically embed stress, increasing inflammation and dysregulating stress-response systems, with downstream effects on cognition, mental health, and physical health. These effects, in turn, lead to costly treatments, job absenteeism, unemployment, and earnings (i.e., health capital model).

In addition to the mechanisms, factors determined before the onset of bullying may play a role as moderators or potential confounders. Demographic characteristics (e.g., sex at birth, family socioeconomic status) may strengthen or weaken the links between bullying, mediators, and labor market outcomes. Furthermore, social structures (e.g., norms, laws, institutions, and cultural narratives; or macrosystems in the bioecological model) as well as individual traits shaped by genes and early experiences (e.g., innate abilities, biologically based vulnerabilities or susceptibilities) may simultaneously predict peer adversity, mediators, and outcomes, thus

confounding the true causal relationship between bullying exposure and labor market outcomes. For instance, social stereotypes could lead to discrimination against socially devalued identities (e.g., individuals experiencing stigma due to psychotic-like experiences). During childhood and adolescence stereotype-driven discrimination may translate into an increase in bullying exposure, whereas during adulthood it may lead to lower employability and earnings.

Altogether, our proposed integrative framework synthesizes economic and developmental perspectives to explain how school-age bullying can reverberate into adult employment, earnings, and job quality through four interconnected pathways – skills, social capital, identity, and mental health – shaped by macrosocial structures and individual susceptibility. We discuss each of these factors below.

Figure 1: Integrative framework of how bullying exposure affects labor market outcomes



Notes: To avoid cluttering, this figure focuses on the most relevant links between the variables of interest omitting other potential connections. Specifically, mediators may interrelate with each other; social structures and individual traits formed early in life – which while relatively stable over the life course, may vary over time – could also operate as moderators and not only as potential confounders.

IV.A. Skill development

The human capital theory posits that individuals invest in education and training because these investments raise productivity and earnings (Becker, 1962). Classic models define skills as multidimensional, including cognitive competencies (e.g., literacy, numeracy) and non-cognitive or socio-emotional competencies (e.g., perseverance, self-control, sociability, motivation, self-esteem) (Acemoglu & Pischke, 1999; Borghans, Duckworth, et al., 2008; Borghans, Ter Weel, et al., 2008; Bowles et al., 2001; Dukes et al., 2021; Ingram & Neumann, 2006; Lise & Postel-Vinay, 2020). These skills are produced in a multistage process with self-productivity (i.e., skills today boost skills tomorrow) and dynamic complementarity (i.e., early skills make later investments more productive) (Cunha & Heckman, 2007). This structure implies that negative shocks during childhood or adolescence can have cumulative effects on later productivity by both lowering the level of skills and reducing the payoff to subsequent investments (Francesconi & Heckman, 2016; Gertler et al., 2014).

Within this framework, bullying victimization can impede skill accumulation and educational attainment by (i) disrupting learning time and classroom engagement; (ii) reducing completion of secondary or tertiary credentials; and (iii) harming the development of skills such as logical reasoning, self-regulation, perseverance, and sociability, which are central inputs into later learning and job performance (e.g., Sarzosa & Urzúa, 2021). These mechanisms are consistent with dynamic complementarity: early reductions in socio-emotional and cognitive inputs make later investments less effective, potentially amplifying gaps over time.

Multiple empirical studies reporting a negative impact of youth bullying exposure on adult labor outcomes also find that targeted youth complete fewer years of education (e.g., Brown & Taylor, 2008; Hasnat & Fakir, 2023; Mukerjee, 2018). In addition, causal and quasi-

experimental evidence demonstrate an adverse effect of bullying exposure on educational achievement. Studies using propensity score matching from Italy, Brazil, Ghana, and across 15 Latin American countries have found an effect on math, reading, and science test scores around 0.15 standard deviations (σ), with effects typically stronger for older students and those in classrooms with a higher proportion of boys or led by male teachers (Delprato et al., 2017; Kibriya et al., 2017; Oliveira et al., 2018; Ponzo, 2013). Estimates based on instrumental variables reach similar conclusions. A Danish study using classmates' exposure to domestic violence as an instrument for bullying exposure – an instrument associated with negative effects on long-term earnings in Carrell et al. (2018) – found that peer victimization lowers 9th-grade GPA (Eriksen et al., 2014). Similarly, in the Colombian context, a study using the school-level age dispersion as the instrument, estimated a negative effect on test scores around 0.55σ in grade 9 and 0.37σ in grade 11 (van der Werf, 2014).

Complementary literature highlights non-cognitive skills as a protective asset preventing bullying exposure as well as facilitating higher educational achievement. For instance, Sarzosa, 2021 and Sarzosa and Urzúa, (2021) model the mediating effects of a composite of socio-emotional skills (self-esteem, internal locus of control, task completion) in the link between bullying exposure and tertiary attendance. These authors report a negative effect of bullying exposure on college enrollment that is concentrated among students in the lower half of the distribution of these socioemotional skills (around 7 percentage points). Furthermore, they demonstrate that one standard deviation increase in these skills reduces bullying victimization risk by around 6%. Consistent with these results, recent experimental evidence from China shows that a scalable, parent-focused empathy intervention effectively increases students' empathy (measured by perspective-taking, empathic concern, and prosociality) and reduces

bullying perpetration and victimization, underscoring the malleability of socioemotional inputs that matter for peer relationships, later learning, and labor success (Cunha et al., 2023).

IV.B. Social capital

Social capital refers to the resources embedded in – and made accessible through – social networks: information about vacancies, referrals and references, informal mentoring, and early job matches (Lin, 2002). In labor markets, these networked resources shape who hears about openings, who gets interviews, and the quality of initial matches (Beaman & Magruder, 2012; Dustmann et al., 2016; Jackson, 2009). Empirical work across contexts shows sizable labor returns to networks via family ties, classmates, and friendship links (e.g., Hensvik & Skans, 2016; Jackson et al., 2017; Lleras-Muney et al., 2020). Within families, intergenerational links to employers are common and profitable, raising entry wages and accelerating early careers (Staiger, 2020). Among peers, larger high-school friendship networks predict higher young-adult wages, on the order of a one-year-of-schooling premium (Lleras-Muney et al., 2020). These patterns illustrate how social networks, not just skills, help determine employability, earnings, and job quality.

Network advantages formed in childhood and adolescence also relate to socioeconomic mobility. Large-scale administrative studies show that communities with greater economic connectedness – more cross-class ties between low- and high-income youth – exhibit higher rates of upward income mobility in adulthood (Chetty et al., 2022a, 2022b). At the individual level, denser, more diverse adolescent friendship networks expand access to information and referrals during school-to-work transitions, improving placement into higher-quality first jobs (Jackson et al., 2017; Lleras-Muney et al., 2020). Thus, social capital accumulated early can be carried forward and converted into labor-market opportunity.

Bullying exposure erodes this stock of social capital. By design, bullying isolates targets, damages friendship quality, and fosters withdrawal from peer contexts where ties are made and maintained (Brañas-Garza et al., 2024; Huang et al., 2023; Scholte et al., 2009). Quantitative and qualitative evidence links victimization to lower generalized peer trust, reduced social confidence, and greater loneliness at school – mechanisms that shrink networks and limit their economic usefulness. For example, generalized peer trust mediates associations between victimization and poorer psychosocial adjustment in adolescence, indicating that targeted youth become less trusting of peers and more socially withdrawn, with downstream effects on relationship-building opportunities (Betts et al., 2017). In young adults who were bullied as children, common sequelae include persistent difficulties with trust in friendships and intimate relationships, avoidance of new social ties, and wariness in group settings – patterns that directly hinder networking and referrals during job search and early career moves (DeLara, 2019).

IV.C. Identity formation

Adolescence is a sensitive period for building a coherent sense of self. Developmental theories (Erikson identity work, 1950; bioecological perspective in Spencer, 1995; Spencer et al., 2006) emphasize that feedback from peers, teachers, and family signals who belongs, who is valued, and what futures feel attainable. When that feedback takes the form of persistent peer devaluation, identity formation can derail. Stigmatizing messages that begin as external assaults (e.g., "you don't belong") can become internalized over time, shaping behavior – self-silencing, withdrawal, impression-management to "just be normal" – and eroding global self-esteem and domain-specific self-concepts in academic and social domains (Meland et al., 2010; Roeleveld, 2011; Thornberg et al., 2013). Meta-analytic and longitudinal evidence aligns with this pathway: victimized youth report reliably lower self-esteem, and self-esteem frequently mediates links

from victimization to internalizing symptoms and economic productivity (van Geel et al., 2018; Xie & Su, 2022).

Identity harm extends beyond self-worth. Peer victimization also disrupts identity coherence – the sense of continuity across roles and settings – especially when "school identities" (e.g., being a good student or a liked peer) are threatened and can't be reconciled with identities at home or in other contexts. Inconsistent feedback from adults and peers amplifies this fracture (Van Hoof et al., 2008). Coping then creates feedback loops: avoidant strategies (hiding, disengagement) co-evolve with lower self-concept and sustain victimization, whereas approach or support-seeking aligns with better adjustment (Houbre et al., 2010). Cognitively, victimization both predicts and is reinforced by negative automatic thoughts about the self and others, entrenching identity disturbance (Ding et al., 2025). In short, identity processes sit at the crossroads of how adolescents interpret adversity, choose contexts, and engage with people who could help them grow.

These identity dynamics plausibly spill into the school-to-work pipeline. A broad literature in labor economics and psychology links self-beliefs to later labor success. Higher self-esteem in adolescence and early adulthood predicts more schooling, higher wages, and entry into more prestigious occupations, even net of academic achievement and family background (De Araujo & Lagos, 2013; Drago, 2011; Magnusson & Nermo, 2018; Nyhus & Pons, 2005; Waddell, 2006). Broader core self-evaluations (self-esteem, self-efficacy, locus of control, emotional stability) are likewise associated with higher earnings (Williams & Gardiner, 2018). Mechanistically, self-esteem supports employability-oriented behaviors such as adaptability, opportunity seeking, and proactive career development by raising job-search effectiveness and match quality (Lo Presti et al., 2020).

Bringing these strands together, identity formation operates as a mediating channel in our integrative framework. Bullying-induced shifts in self-concept lower achievement motivation and persistence, dampen initiative and interview performance, narrow occupational aspirations, and can raise separation risk under stress – traits and behaviors that employers reward and that shape early matches, wages, and progression (e.g., DeBeaumont & Girtz, 2019). Identity threats also indirectly depress human capital (steering students away from challenging tracks and from activities that build credentials and leadership signals) and constrict social capital (eroding trust and shrinking networks). Finally, identity and mental health are reciprocally linked: internalized devaluation fuels internalizing symptoms that impair attention and executive function at school and at work.

IV.D. Mental and physical health

According to the health capital theory, both physical and mental health can be viewed as productive stock that expands "healthy time," raises on-the-job performance, and increases the returns to education and training; shocks that deplete this stock reduce employment, hours worked, and wages (Grossman, 1972). Consistent with this theorization, longitudinal and panel studies have linked depression, anxiety, and serious psychological distress to lower employment rates, fewer weeks worked, and earnings penalties – even with rich controls and designs that explicitly address selection bias (Andersen et al., 2024; Bryan et al., 2022; Chatterji et al., 2007; Germinario et al., 2022). Importantly, access to effective care attenuates these harms. For example, Biasi et al.,(2021) show that US Congress's 1976 authorization of lithium as maintenance treatment for bipolar disorder increased beneficiaries' earnings by roughly 15%, and randomized evaluations in low- and middle-income countries report that treating common

mental disorders improves work participation and income, underscoring policy leverage on the labor margin (Lund et al., 2024).

A large empirical literature demonstrates that bullying victimization prospectively predicts inflammation, weakening of the immune system, internalizing problems, suicidality, psychotic-like experiences, externalizing symptoms, and behavioral difficulties across dozens of cohorts, with the largest effects observed among youth with frequent or multi-context (e.g., peers and siblings) victimization (Cunningham et al., 2016; Dantchev et al., 2018; Pontillo et al., 2019; Reijntjes et al., 2010; Schaefer et al., 2018; Schoeler et al., 2018; Schreier et al., 2009; Singham et al., 2017; Ttofi et al., 2012; van Geel et al., 2014, 2022). Long-run follow-ups into adulthood document that these risks remain in the long term in the form of elevated psychological distress and higher use of health services (Evans-Lacko et al., 2017; Takizawa et al., 2014; Wolke et al., 2013). Evidence also links victimization to inflammation and altered immune functioning (Copeland et al., 2014; Roberts et al., 2023; Trotta et al., 2021).

Multiple studies suggest these lingering effects operate via a recalibration of neurobiological systems. Twin-based evidence shows blunted cortisol reactivity to social-evaluative stress among bullied co-twins relative to their genetically identical, non-bullied siblings – quasi-causal estimates of HPA-axis dysregulation (Ouellet-Morin, Danese, et al., 2011). In broader samples, altered stress reactivity co-varies with poorer socio-behavioral functioning, consistent with pathways to learning and work readiness (Ouellet-Morin, Odgers, et al., 2011). Autonomic profiles suggest hyper-reactivity in adolescence and hypo-reactivity in adulthood, implying age-graded recalibration of arousal and recovery. Neuroimaging work links victimization to disturbances in large-scale networks crucial for attention and control (e.g., default mode, dorsal-attention, and fronto-parietal systems), as well as to cortical and white-

matter differences that align with episodic-memory and executive-function costs (Du Plessis et al., 2019; Menken et al., 2023; Muetzel et al., 2019; Mulder et al., 2020; Rudolph et al., 2021; Wen et al., 2023).

Together, this biological embedding of bullying exposure helps explain persistence and heterogeneity in mental health sequelae and make plausible a durable pathway from adolescent victimization to adult functioning. Synthesizing theory and evidence, mental health is a mediating channel from bullying victimization to adult employment, earnings, and job quality. Elevated depression and anxiety, sleep disturbance, and stress-system dysregulation reduce learning efficiency, increase absenteeism, and termination risk as well as dampen search intensity and interview performance, hurting match quality and wage growth (e.g., Andersen et al., 2024; Bryan et al., 2022; Chatterji et al., 2007; Germinario et al., 2022).

IV.E. Moderators and potential confounders

Beyond mechanisms, factors determined before the onset of bullying exposure can operate as moderators or potential confounders of the link between peer victimization and labor-market outcomes. Most empirical work on moderators emphasizes demographics, while potential confounders are less thoroughly addressed. Drawing on multiple theoretical traditions, we argue that socially devalued identities, innate skills, diatheses, and susceptibilities are plausible confounders that researchers should attempt to address empirically.

IV.E.1. Moderators: intensity, timing, sex, and context

Across studies, the adverse consequences scale with intensity and chronicity. Prospective evidence links repeated or multi-type victimization to larger penalties than single episodes (Strøm et al., 2013; Wolke et al., 2013), and broader cumulative-adversity indices show steeper

downward trajectories in income and occupational prestige as exposures accumulate (Fernandez et al., 2015). Timing also matters with stronger negative associations in the long term when exposure occurs during middle school years between ages 11 and 14 (after age 12 in Mukerjee, 2018; between 9 and 14 in Summerfield, 2024; and at 11 more than 7 in Blanchflower and Bryson, 2024), a period when identity formation processes and classroom reorganizations have found to be more influential on youth's development (Brass & Ryan, 2025; Dhuey, 2013; Rockoff & Lockwood, 2010). Relatedly, some of the evidence suggests attenuation of effects on earnings into midlife (e.g., wage gaps at ages 23 and 33 shrink by 43 in Brown & Taylor, 2008), whereas employment shortfalls can persist or widen at older ages in the NCDS (Blanchflower & Bryson, 2024) – implying different life-cycle profiles by outcome.

Contextual moderation is less studied and yields mixed patterns across and within societies. In cross-country comparisons, economic development seems to play a role by showing differing patterns when assessing effects on employment and earnings. In higher income countries bullying victimization typically associates with lower employment and earnings, whereas in lower income countries it relates to more working hours during a typical year but lower pay and earnings (Hasnat & Fakir, 2023).

Within countries, subgroup analyses also point to uneven burdens. While Drydakis (2014) estimates larger penalties for sexual minorities and immigrants, the role of individuals' sex is not as straightforward. Larger wage penalties appear for males in some US based estimates (Mukerjee, 2018) and for male unemployment at midlife in the NCDS (Takizawa et al., 2014), while women show larger wage losses in NLSY97 (Summerfield, 2024) and lower earnings at age 50 in the NCDS (Brimblecombe et al., 2018); Gorman et al. (2021) report broadly similar unemployment patterns by sex once intensity and type are accounted for. One potential

reconciliation of these seeming contradictions is a sex–victimization-type interaction: Conway et al. (2024) find that social exclusion predicts lower income for females, whereas robbery and taken things by force predicts larger losses for males. More broadly, social norms may shape labor-market returns: Kaestner and Malamud (2023) show that girls labeled *headstrong* and boys labeled *dependent* in youth face adult wage penalties, suggesting stereotype-consistent expectations can magnify or mask bullying-related disadvantages.

IV.E.2. Potential confounders

Predetermined factors can confound the causal relationship between bullying exposure and labor-market outcomes. Following the bioecological model, bullying processes, mediators, and labor outcomes interrelate across ecological levels that shape development (Bronfenbrenner, 1994; Bronfenbrenner & Morris, 2007; Del Toro et al., 2025). These levels include a macrosystem (e.g., norms, laws, institutions, and cultural narratives) and chronosystem (representing the role of policies or historical events on the life course) that connect with interacting microsystems (e.g., relationships at school including teachers, parents, peers; interactions with friends, colleagues, or potential employers), where the negative effects of social adversity are realized.

Within this structure, social norms and institutions can produce stereotypes and socially devalued identities that both raise exposure to bullying and depress adult labor returns, thereby moderating or confounding observed associations. Extensive evidence has documented that the average employer tends to discriminate at the hiring stage (i.e., taste-based and statistical discrimination theories) against individuals of color (e.g., Bertrand & Duflo, 2017; Lang & Lehmann, 2012; Neumark, 2018), women (Rivera & Tilcsik, 2016; Zimmerman, 2019), immigrants (Busetta et al., 2018; Quillian et al., 2019), obese (Busetta et al., 2020; Rooth, 2009),

physically unattractive (Galarza & Yamada, 2014), from low socioeconomic status (Banerjee et al., 2009; Núñez & Gutiérrez, 2004; Rivera & Tilcsik, 2016), and identified as LGTBQ (Patacchini et al., 2015). Importantly, there is also supportive evidence demonstrating that these adults may also be at a higher risk of peer victimization during their childhood and adolescence (Forsberg, 2017; Thornberg, 2011).

Individual predispositions can likewise confound. The signaling theory as well as the diathesis-stress and differential susceptibility models posit underlying abilities or vulnerabilities that influence both exposure to bullying and later labor outcomes (Arcidiacono et al., 2010; Belsky et al., 2007; Monroe & Simons, 1991; Spence, 1973). In the signaling theory, it is not the development of skills through education or previous training that leads to higher productivity and employability, but an innate capacity to learn the skills required for any specific position (Huntington-Klein, 2021; Spence, 1973). Likewise, the diathesis-stress and differential susceptibility models posit that a biologically based factor confers vulnerability to developing mental health problems, which in turn may negatively affect bullying exposure and labor market outcomes (Ellis et al., 2011; Swearer & Hymel, 2015). In these three theorizations, an underlying trait determined by genes and/or early experiences may operate as moderators or potential confounders in the causal link between bullying exposure and labor market outcomes.

A concrete example is ADHD. A substantial body of theory holds that core features of ADHD create a diathesis for involvement in bullying, both as a perpetrator and, more frequently, as a target (Holmberg & Hjern, 2008; Simmons & Antshel, 2021). Youth with ADHD often have difficulties in encoding, processing, and applying social information, which can manifest as a tendency to misinterpret ambiguous social cues as hostile, leading to reactive aggression that provokes peer conflict and rejection (Postigo et al., 2013). More broadly, individuals with

ADHD typically show lower levels of Theory of Mind – the ability to understand others' mental states, beliefs, and intentions (Shakoor et al., 2012) – and struggle to infer peers' pragmatic intent (e.g., irony, second-order beliefs), which undermines perspective taking and smooth turn-taking in peer exchanges (Caillies et al., 2014). Such challenges can operate as confounders in the causal link between bullying victimization and labor market outcomes if (1) the onset of ADHD symptoms occurs during toddlerhood or early childhood (Rocco et al., 2021; Willoughby et al., 2000); (2) symptoms prevent a child from accurately reading social situations, understanding social rules, or recognizing the impact of their behavior on others, leading to peer difficulties such as bullying (Nejati, 2022; Stenseng et al., 2016, 2025); and (3) symptoms lead an adult to develop negative social relationships at work, job instability, and lower earnings (Fletcher, 2014; Gordon & Fabiano, 2019; Patel et al., 2021).

Together, macrosocial discrimination, identity-based stereotypes, innate abilities, and biological susceptibilities can jointly raise both the probability of being bullied and the likelihood of poorer adult labor outcomes, creating spurious associations or exaggerating true effects. Empirical strategies should carefully consider designs controlling for stable individual or family traits (e.g., twin/co-twin and fixed-effects panels) or leverage exogenous shifters of exposure (policy changes, cohort rollouts, classroom composition instruments). Addressing these identification challenges would improve intervention targets (individual with high susceptibility or structural risk), what to measure (mediators like skills, networks, identity, and mental health), and how to design programs and laws so that estimated impacts reflect bullying itself rather than background risks.

V. Implications for research, interventions, and policy

The evidence reviewed above demonstrates that individuals exposed to bullying victimization in early life consistently report lower earnings, income, and wealth in adulthood. It also suggests targets consistently experience worse employment outcomes – ranging from outright unemployment and labor-force detachment in high-income countries, to precarious employment in low-wage, informal-sector jobs in lower-income settings. The magnitude of these effects is economically meaningful: earnings penalties range from roughly 1–25% depending on cohort, age at measurement, and victimization intensity, while employment gaps reach 3–7% in midlife. Effects also persist decades after exposure ends, appear largest for frequent, violent, or multi-type victimization occurring during early adolescence, and show substantial heterogeneity by sex, type of bullying, and socioeconomic context.

Our integrative framework identifies four primary pathways through which these long-run labor-market penalties may emerge: (1) reduced human capital accumulation via disrupted learning, lower educational attainment, and impaired development of cognitive and socio-emotional skills; (2) erosion of social capital through isolation, damaged peer relationships, and diminished trust that limit access to job information and referrals; (3) altered identity formation processes that lower self-esteem, narrow occupational aspirations, and reduce proactive career behaviors; and (4) biological embedding of chronic stress that increases mental and physical health problems, with downstream costs for attention, executive function, absenteeism, and job performance. These mechanisms operate interdependently – skill gaps constrain network access, identity wounds fuel mental health problems, and poor health further limits skill deployment – creating cumulative disadvantage that compounds over the life course. At the same time, our framework highlights that the relationships between bullying, mediators, and outcomes are

shaped by individual vulnerabilities (innate abilities, temperamental susceptibilities, early-life adversities) and macrosocial structures (labor-market discrimination, cultural stereotypes, institutional norms) that may moderate effects or confound causal estimates.

This synthesis of cross-disciplinary evidence carries concrete implications for researchers, practitioners, and policymakers. In this section, we outline priorities for future research, discuss evidence-based intervention strategies, and consider policy levers at school, community, and government levels. We organize our discussion around three questions: (1) *What do we still need to know?* We identify key empirical gaps, methodological challenges, and promising directions for advancing the science of bullying's long-run effects. (2) *What should interventions target, and what works?* We review mechanisms to prioritize, synthesize evidence on program effectiveness, and highlight scalable approaches for prevention and mitigation. (3) *What policy actions are justified by current evidence?* We translate findings into actionable recommendations for legislative bodies, emphasizing cross-sectoral coordination and equity considerations.

V.A. Priorities for future research

Despite growing longitudinal evidence, important gaps remain. Addressing these gaps would sharpen causal inference, clarify mechanisms, illuminate heterogeneity, and ultimately guide more effective prevention and intervention. We organize research priorities around three themes: expanding geographic and institutional coverage, strengthening causal identification, and measuring and testing mechanisms.

V.A.1. Geographic and institutional contexts

Most studies originate from high-income, primarily from the UK and US, with limited prospective evidence from low- and middle-income contexts where labor markets differ structurally. The Young Lives study (Hasnat & Fakir, 2023) offers a valuable exception, but replication across diverse institutional settings is essential for understanding boundary conditions and external validity.

Emerging cross-national patterns suggest that the form of labor-market impacts varies systematically with institutional context. In Europe, studies suggest that bullying exposure leads to lower employability that tends to worsen over time, with employment gaps persisting or even widening into midlife (Blanchflower & Bryson, 2024). In the US and Canada, however, links to labor participation or unemployment appear less strong; instead, bullying victims report higher job instability (Sansone et al., 2013), shorter tenure, lower task complexity, reduced job satisfaction, and fewer working hours – suggesting disruptions to job quality and attachment rather than outright exclusion from employment. In lower-income countries, bullying exposure is linked to an increase in the number of hours employed, but concentrated in low-paying, informal-sector jobs with little security (Hasnat & Fakir, 2023). These differences likely reflect variation in employment protection legislation, unemployment insurance generosity, educational tracking systems, and pathways from school-to-work. More research is still needed from different countries, regions, and areas varying in their social vulnerability to understand how the effects of bullying exposure on employment and occupation relate to those on earnings and wealth accumulation, and to learn which policy levers are most effective in different environments.

V.A.2. Strengthening causal identification

Causal identification remains a central challenge. Variables determined before bullying onset may confound causal estimates. Employers systematically discriminate against groups – people of color, women, immigrants, LGBTQ individuals, those with obesity or low SES – that also face elevated bullying risk during childhood. This dual exposure means estimated associations between bullying and earnings may partly reflect ongoing structural discrimination rather than bullying's causal impact. A similar logic applies to early-emerging individual traits like ADHD, which leads to both higher bullying risk (due to social difficulties, impulsivity, defense challenges) and adult wage penalties (reflecting task completion, attention, workplace relationship difficulties).

While quasi-experimental designs using instrumental variables (e.g., classmates' domestic violence exposure, local crime rates) or fixed-effects models (sibling, co-twin, or individual-level panels) represent important advances, these approaches rely on strong assumptions that are rarely tested comprehensively. Instruments must satisfy the exclusion restriction – affecting labor outcomes *only* through bullying – yet domestic violence exposure or neighborhood crime may independently shape skill development, mental health, and employability via family stress, resource constraints, or direct trauma. Family fixed effects control for shared background but cannot rule out child-specific shocks (e.g., illness, differential parenting, sibling rivalry) that correlate with both victimization and later outcomes. Twin designs offer cleaner identification by comparing genetically identical individuals raised in the same household but still can be constrained by low power or bias when the within-pair correlations between bullying exposure are high (Esen et al., 2024).

Future work should prioritize robustness checks across multiple identification strategies within the same sample, allowing researchers to assess whether estimates converge or diverge depending on the source of variation. Natural experiments – such as staggered policy rollouts of anti-bullying programs, random assignment of students to classrooms or schools in administrative lotteries, or sharp changes in school composition due to redistricting – offer promising opportunities for credibly causal inference. Additionally, sensitivity analyses quantifying how large unobserved confounding would need to be to overturn results (e.g., Oster, 2019) would help readers assess the plausibility of causal claims. Critically, designs must explicitly grapple with confounders shaped by social structures (e.g., discrimination against marginalized groups) and individual susceptibility (e.g., early-emerging temperamental or cognitive traits).

V.A.3. Measuring and testing mechanisms

Mechanistic evidence – direct tests of the pathways proposed in our integrative framework – is surprisingly thin. Few studies measure all four mediators (skills, social capital, identity, mental health) in the same cohort and formally decompose total effects into indirect pathways using structural equation models or causal mediation frameworks. Where mediation is tested, it typically focuses on a single channel (e.g., educational attainment or depression) rather than examining how mechanisms interact and accumulate.

Critical questions requiring mechanistic research include: Do mechanisms operate independently, or do they amplify one another? Does skill disruption intensify identity harm by foreclosing academic pathways that might otherwise affirm competence? Does social isolation worsen mental health directly, or is the relationship mediated by loneliness and reduced access to support? Do certain mediators operate in sequence – for instance, early skill deficits leading to

lower educational attainment, which then constricts social networks and produces job mismatch – or do they exert parallel, independent effects? Answering these questions requires rich, repeated measures of mediators across development, alongside modern causal mediation methods that accommodate multiple, potentially interdependent pathways and time-varying confounding (Qin, 2024; VanderWeele, 2016).

Moreover, the complex inter-relations between mediators carry important implications for intervention design. Under certain circumstances, developing technical skills that enhance productivity may be easier in contexts that restrict opportunities for building social capital and diverse networks. Evidence from education sciences shows that creating more academically homogeneous classrooms can lead to higher learning via better targeting of instruction to students' current levels (Duflo et al., 2011), especially if disruptive students are placed in smaller classrooms to facilitate managing behavioral problems while larger classrooms are designed to teach more advanced skills (Lazear, 2001). Yet social psychology and economics have shown that promoting contact with others who have different identities, backgrounds, and resources leads to increased tolerance, social cohesion, and even economic returns (Chetty et al., 2022a, 2022b). The case of economic integration presents an illustrative example: Rao (2019) shows that when high-income students are more exposed to lower-income peers in integrated schools, they become more generous, more prosocial, and less likely to discriminate against lower-income individuals. Collectively, these findings suggest potential trade-offs between optimizing academic skill development through ability grouping and maximizing social capital formation through diverse peer exposure. Research clarifying when these trade-offs are real versus illusory, and identifying school structures that achieve both goals simultaneously, would inform more nuanced intervention strategies.

V.B. Implications for interventions

Evidence on heterogeneity points to high-priority populations for intensive support: youth with early susceptibility markers (ADHD, temperamental reactivity, social difficulties), chronic victims and bully-victims, those experiencing multiple victimization types, youth with high home adversity, and adolescents ages 11–14. This window typically coincides with middle school – years consistently linked to dips in achievement, engagement, and connectedness, alongside heightened status concerns and conflict – implying higher returns to preventive "dose" at entry and in early middle grades (Dhuey, 2013; Rockoff & Lockwood, 2010). In parallel, developmental work underscores that middle school is a brief period when identity work accelerates and teachers can scaffold routines, empathy, and safe spaces for difficult conversations – practices that dovetail with bullying prevention and repair (Branje et al., 2021; Reimer, 2023; Verhoeven et al., 2019).

Our four-pathway framework indicates that interventions addressing skills, social capital, identity, and mental health simultaneously or sequentially may lead to greatest impacts. For skill development, interventions include academic support, tutoring, and socio-emotional learning curricula that build perseverance, self-control, and social awareness – competencies that both protect against victimization and support later learning and job performance (Sarzosa & Urzúa, 2021). For social capital, structured peer mentoring, cooperative learning activities, and network-building opportunities can repair damaged relationships and create access to information and referrals that matter for school-to-work transitions. For identity, programs providing self-esteem support, identity affirmation, and counter-stereotype interventions can interrupt internalization of stigmatizing messages and broaden occupational aspirations. For mental health, early screening, integrated school-based services, and removing barriers to treatment access are critical, given

evidence that treating common mental disorders improves work participation and income (Biasi et al., 2021; Lund et al., 2024).

Because bullying is a social process sustained by peer norms and dynamics, interventions supporting youth at higher risk of peer victimization are likely to become more effective when paired with whole-school programs, aiming to reduce both the situational rewards to peer victimization and the internal vulnerabilities that sustain victimization (Martínez et al., 2024; Rapee et al., 2020; Salmivalli, 2023). Effective programs raise bystanders' empathy and shift classroom norms via universal lessons, while deploying indicated conversations and follow-ups for acute cases; multi-country evidence documents effectiveness and, in some settings, cost-effectiveness (Gaffney et al., 2019, 2021; Huitsing et al., 2020; Kärnä et al., 2013). Still, average schoolwide gains can leave remaining victims worse off through increased self-blame or concentration of attacks – a phenomenon known as the *healthy context paradox* – underscoring the need to pair universal prevention with case-focused supports (e.g., tutoring and targeted therapy) for chronic or poly-victims identified through routine data and staff referral (Huitsing et al., 2019; Juvonen & Schacter, 2020; Salmivalli, 2023).

Outside schools, partnering with families can amplify prevention and repair. Meta-analytic work shows that involving parents through training and sharing structured information can be an effective strategy to reduce bullying and victimization (Huang et al., 2019). A recent randomized evaluation of a low-cost, four-month parental empathy program showed that skills such as perspective-taking, valuing uniqueness, and managing relationships can be built in caregivers and then spill over to youth, peers, and classroom climate (Cunha et al., 2023). Such family-directed support is well-suited to run alongside whole-school routines as they bolster emotion regulation and empathy at home while schoolwide practices recalibrate norms,

supervision, and bystander behavior. Public investment to scale these complementary, evidence-based approaches is a promising route to reducing the lasting economic impacts of bullying victimization.

V.C. Implications for policy

In the last 25 years, growing evidence on the harms of bullying and the effectiveness of school programs has been matched by greater public attention and governments' policies. In the United States, anti-bullying laws (ABLs) spread from essentially zero circa 2000 to near-universal coverage by the mid-2010s. These legislations typically require school districts to define bullying, establish (often anonymous) reporting system, investigate and document incidents, apply graduated sanctions, train staff, and communicate with parents. Most states have added cyberbullying provisions extending obligations to electronic and off-campus conduct and, in some cases, issued model policies and templates to guide districts (Dasgupta, 2019; Prince, 2020).

Quasi-experimental studies have consistently shown mental-health benefits, with stronger ABLs linked to reductions in suicide mortality on the order of 2% to 4%, alongside decreases in depression, as well as suicidal ideation and attempts (Rees et al., 2022). These positive effects are complemented by overall negative impacts on bullying prevalence ranging from non-significant changes to reductions up to 8.4%, with stronger effects in states the law provides more specific definitions of bullying (Dasgupta, 2019; Nikolaou, 2017; Prince, 2020). In contrast, the evaluations for cyberbullying have found that electronic reports of bullying have increased, which may be explained by heightened awareness and lower reporting costs (Dasgupta, 2019; Manzella, 2018).

Several design and implementation features affect how well ABLs integrate with school operations. Statutes often mandate procedures and sanctions but provide little or no funding for implementation – leaving schools to reshuffle budgets to cover supervision, data systems, and case management (Sabia & Bass, 2017). Monitoring of fidelity is typically paperwork-focused; incident coding and thresholds vary by district; and cyber policies face practical barriers (e.g., First Amendment constraints around disciplining offensive but protected speech). Finally, equity safeguards are uneven: selective enforcement and under-recognition of relational aggression can leave marginalized groups less protected (Dasgupta, 2019).

To better integrate ABLs with prevention efforts by schools and families, states should pair mandates with implementation supports. Concretely, governments could consider tying statute requirements to funded, evidence-based whole-school programs as well as targeted services for youth at a higher risk of bullying victimization (e.g., chronic victims); prioritizing psychosocial interventions in middle schools; ensuring adequate funding and resources for non-teaching staff such as counselors, psychologists, and social workers; implementing anti-retaliation and anonymous reporting, and give districts model procedures that align with legal requirements; embedding parents via brief empathy trainings and referral pathways to community mental-health; and securing funding for data and evaluation. A tighter articulation between policy design, schoolwide implementation, provision of targeted supports, and family engagement is the most credible route to preventing victimization and mitigating its long-run economic costs.

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