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Cumulative Disadvantage and Youth Well-Being: A Multi-domain Examination with Life Course Implications

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Abstract The accumulation of disadvantage has been shown to increase psychosocial stressors that impact life course well-being. This study tests for significant differences, based on disadvantage exposure, on youths' emotional and physical health, as well as family supports, peer assets, and academic success, which hold potential for resilience and amelioration of negative health outcomes. A 12 item cumulative disadvantage summed index derived from surveys of a racially and socioeconomically diverse sample of urban high school seniors (n = 9658) was used to distinguish youth at low, moderate, and high levels. Findings supported hypothesized stepped patterns such that as multiple disadvantages accumulate, a concomitant decline is evident across the assessed outcome variables (except positive academic identity). Post-hoc tests indicated a pattern of groups being significantly different from one another. Overall, results lend support for an additive stress load associated with stacked disadvantage, with implications for continuing trends into adulthood as well as preventive interventions.

Keywords Stress · Disadvantage · Adversity · Youth · Health · Life course

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Introduction

Life course models are amplifying attention to early life conditions as roots of later health and status attainment disparities (Braveman and Barclay 2009; Shonkoff et al. 2009). In addition to factors such as health behaviors and services access, it is becoming increasingly apparent that a significant component of life course well-being is shaped by the social environment and the ways that disadvantages "stack up" and contribute to a cumulative burden (Nurius et al. 2015; Turner 2013). Social and material inequalities and sources of marginalization form the backdrop of everyday life for disadvantaged youth, constituting stressors and deprivations that exert influence both contemporaneously and as part of life course trajectories.

This study draws upon a sociodemographically diverse sample of high-school seniors to test for hypothesized patterns of difference across multiple domains of well-being as a function of cumulative disadvantage. Cumulative disadvantage here captures a developmental snapshot of youths' aggregated social status characteristics and discrimination experiences that signal differential exposure to stressors and to access to psychosocial resources. We draw upon life-course-stress models to undergird theorizing about the additive effects of multiple facets of social disadvantage in jeopardizing physical and emotional health of youth, as well as family, peer, and academic health resources that hold promise for fostering resilience in the context of disadvantage. In considering the implications of these findings, we address early life and adolescent points of preventive and remedial intervention as well as life course repercussions that, collectively, are widely applicable to social work practitioners and researchers engaged with stressed and vulnerable populations.

Cumulative Disadvantage Framework

Cumulative disadvantage offers a compelling framework to understand how social and material inequalities, alongside experiences of discrimination, add up and exert influence on life course trajectories. Within this framework, societal stratification, based on personal characteristics such as race, socioeconomic status, nativity, and gender are understood to promote the accumulation of advantage for some and disadvantage for others (for overviews see Seabrook and Avison 2012; Schafer et al. 2011). Accumulation of disadvantages are theorized to affect individual health/mental health outcomes through societal and socially-structured variations in stress exposure, differential access to psychosocial resources, and the differential effect of psychosocial resources to buffer negative effects for individuals with higher disadvantage (Aneshensel 2009). Variations in stress exposure and access to resources link disadvantaged statuses to physical and emotional health vulnerability (McLeod and Owens 2004).

Growing attention to cumulative disadvantage highlights the need to integrate individual-level factors like early life adversity with population-level social dynamics in order to account for the influence of macro-structural forces within individual life course trajectories (Dannefer 2003). Cumulative stress models explicate adult physical and mental health inequalities and subsequently highlight the critical role of childhood and adolescence as key developmental periods to intervene and interrupt health-eroding trajectories (Ferraro and Shippee 2009). For example, poorer physical health earlier in life, combined with early acquisition of negative health behaviors, sets the stage for health-weathering processes that accelerate chronic disease formation (Geronimus et al. 2006).

Adolescence and Cumulative Disadvantage: Implications for Healthy Development

Studies to date focus predominantly on lifetime disadvantage relative to adult physical and mental health. However, racial/ethnic minority, immigrant, and low socioeconomic (SES) youth may face unique barriers as they transition to adulthood, including protracted or truncated trajectories through school, higher chances of living in poverty, and fewer social resources that result in poorer attainment and health outcomes (Wickrama et al. 2003). Recent youth-oriented research suggests the value of assessing the implications of both social status markers (e.g. race and socioeconomic status) as well as experience of marginalization such as discrimination on health and development. Initial evidence indicates that multiply-disadvantaged youth (e.g. minority status and low-income) face significantly greater exposure to multiple forms of discrimination (Grollman 2012) that, in turn, increase the odds of both emotional and physical health problems.

Early and enduring exposure to poverty and resource deprivation is well documented as a key culprit in health and achievement disparities (Evans and Kim 2013). Factors related to childhood SES and family disadvantage have demonstrated contributions, for example, to onset of mental health problems in adolescence as well as mental health disparities in emerging and later adulthood (Wickrama et al. 2009). One explanation for the impact of cumulative disadvantage on youth health and achievement problems is through precocious trajectories, or "accelerated adulthood." For example, community and family disadvantage carry immediate and longer-term risk for youth well-being as these uniquely enhance the risk of "precocious life events," e.g. early workforce participation, high school drop-out, or early co-habitation, increasing likelihood of early parenthood, truncated educational attainment and poor occupational status/low SES. These factors impact development and health in adolescence in and adulthood, even after controlling for health in adolescence (Wickrama et al. 2005; Wickrama et al. 2003).

Family, Peer and School Assets to Buffer Effects of Cumulative Disadvantage

Assets within the family, peer, and academic domains can potentially buffer the negative toll that stacked disadvantage plays on adolescent physical and mental health. Education, in turn, offers the potential as an enduring protective factor for physical and mental health (Egerter et al. 2009; Suhrcke and Paz Nieves 2011).

Although family income and parent educational level directly impact youth educational achievement, parental support also indirectly influences both youth school engagement and subsequent achievement (Melby et al. 2008). For example, parental school supports—both instrumental help and high educational aspirations for their children—is positively associated with student course selection and grade point average (GPA) (Witkow and Fuligni 2011). Parental academic involvement in middle school generally predicts fewer problem behaviors and higher educational aspirations in high school; however, the benefits on behavior and performance tend not to be realized for low SES families (Hill, et al. 2004).

School-related supports are also predictive of positive youth development and academic achievements. Peers valuing of school and high educational aspirations help shape adolescents' valuing of education and academic motivation (Nelson and DeBacker 2008, Vitoroulis et al. 2012), contributing to positive academic identity, which is significantly associated with school success independent of other family and school-level contributors (Prince and

Nurius 2014). Factors such as positive school affiliation, a safe learning environment, and peer and family support are positively associated with adolescents' sense of subjective health (Almgren et al. 2009**).** Collective social supports from parents, teachers, and peers also impact youth psychosocial adjustment, including fewer problem behaviors, both internalizing and externalizing (Stewart and Suldo 2011).

We conceptualize assets within these domains as resources to promote positive developmental trajectories for youth. At the same time, the "stacking" of disadvantages may exact a toll on the availability of such resources. In line with theories of how stress proliferates and erodes the availability of support resources, youth who experience multiple forms of disadvantage may experience decrements not only in physical and mental health markers, but also in the assets necessary to buffer these effects.

The Current Study

The central premise of this study is that characteristics representing social disadvantage are additive in nature, constituting stacked or cumulative stressors that convey jeopardy for youth emotional and physical health. The principal hypotheses are that (1) youth distinguished as low, moderate, or high levels of disadvantage will significantly differ across multiple indicators of physical and mental health and that (2) they will also significantly differ in family, peer, and academic support and success-factors that hold potential for their resilience and health promotion. Specifically, we predict that youth with low, moderate and high levels of social disadvantages will demonstrate stepped relationships, with each group revealing progressively less favorable health, support, and success.

Methods

Sample and Recruitment

Researchers with the University of Washington's Beyond High School project (Hirschman and Almgren 2015) administered surveys across five waves (N = 9658) of senior class cohorts in 2000 and annually from 2002 to 2005. Twelve high schools in Washington State participated in this study of educational attainment and transition to adulthood. The Internal Review Board (IRB) from the Office of Human Subjects at the University of Washington approved this study design. Parents/guardians consented to their children's participation if respondents were under age 18, and all respondents consented to participation, with more than 75 % of the participants over age 18 at the time of survey administration. Researchers recruited participants from class lists with the intention of surveying senior classes in their entirety. Respondents voluntarily completed the self-administered "paper and pencil" survey, receiving the nominal incentive of a movie pass. Investigators administered surveys in classrooms or auditorium settings, including mailed questionnaires for students who were absent on the day of administration, ultimately obtaining completed surveys from approximately 91 % of all enrolled seniors within 2 months of their commencement.

The average age of participants was 18 years with 54.6 % being female. Racial/ethnic self-identification by students reflected the following: non-Hispanic White (60.4 %), Hispanic (6 %), Asian (13.2 %), Native Hawaiian and Pacific Islander (4.7 %), African American (13.8 %) and Native American (1.5 %). Fourteen percent of the participants were foreign born, 28.8 % came from immigrant families where one or both parents were foreign born. Research agreements with cooperating schools precluded the inclusion of items pertaining to income, therefore other indicators of socioeconomic status were obtained, e.g. home ownership and parental level of education.

Measures

Cumulative disadvantage is a summative count of twelve dichotomized forms of social stratification and/or discrimination experiences. These include race/ethnicity (Caucasian as majority group = 0, youth of color coded = 1), immigrant status (self, father, mother: 0 = no, 1 = yes), and low income indicators including home ownership (yes = 0, no = 1), parental levels of education (high school diploma or less = 1, more than high school diploma = 0), and household structure (single parent = 1, two-parent = 0), and discrimination experiences (4 items: 1 = yes/0 = no) reported on the basis of respondents' gender, disability, race/ethnicity, or nationality/religion. This summing of indicators parallels prior studies of cumulative forms of adversity and disadvantage (Appleyard et al. 2005; Bauman et al. 2006; Walsemann et al. 2008). As yet there is no consensus as to what number of disadvantages or adversities constitutes a threshold. Thus, we applied a norm (Finkelhor et al. 2005) of anchoring those below the sample median characterized as low disadvantage (0–2 characteristics; 43.62 % of the sample), those in the 3rd quartile as having moderate cumulative disadvantage (3–4 characteristics; 29.27 % of the sample), and those in the upper quartile as having high cumulative disadvantage (5 or more characteristics; 27.11 % of the sample).

Physical health includes *self-assessed health*: "In general, how good is your health" rated on a 5-point Likert-

type scale 1 = poor through 5 = excellent. *Body mass* is defined as underweight (less than 18.5), normal (18.5–24.9), over weight (25–29.9) and obese (30+). *Ever smoked* distinguishes ever smoking on a regular basis. *Dental visits* assesses the frequency of dental care: ("In the past year," "in the past 2 years," and "more than 2 years").

Emotional health includes three Likert-type scales: *Self-esteem* as measured by seven items based on Rosenberg's self-esteem scale ($\alpha = .69$), *locus of control* measured by five items of youths' perception of sense of control ($\alpha = .61$), and *optimistic about future* is measured by a single item question "I feel hopeful about the future." Each of these measures used a common metric (4 = strongly agree, … 1 = strongly disagree).

Family support includes *parental monitoring*—the mean of two indicators of parental knowledge of their friends and their friends' parents scored on a 4-point Likert-type scale 1 = strongly agree… 4 = strongly disagree ($\alpha = .72$). *Parental instrumental help with school* is a five item mean-based frequency measure (1 = not often to 4 = often) of how often parents help with homework and talk to youth about school-related activities ($\alpha = .67$). *Parental educational aspirations* is a summative measure of parents' educational expectations for youth coded from 1 = less than high school diploma through 7 = PhD.

Peer assets include *sense of belonging at school* as a four item measure reflecting youths' perceptions of their ability to relate to peers at school (e.g., "fitting in" or not) based on a 4-point Likert-type scale coded 1 = strongly agree… 4 = strongly disagree; $\alpha = .75$). *Peer educational aspirations* reflects the proportion (1 = "None or some" through 5 = "Most or all") of respondents' peers with immediate educational goals (finishing high school, taking college entrance exams, planning to attend college, not foregoing education for full-time work; $\alpha = .72$). *School safety* is a 3-item measure based on a 4-point Likert-type scale coded 1 = strongly agree… 4 = strongly disagree of youths' sense of safety in their school; e.g., "I don't feel safe in this school (reversed)" ($\alpha = .64$).

Academic success includes *grade point average (GPA)* assessed on an 8 point self-reported scale (from 1 = mostly below D's to 8 = mostly A's). *Held back* is a dichotomous measure of ever being held back a grade in school. *Positive academic identity* is a four item measure based on a 4-point Likert-type scale coded 1 = strongly agree… 4 = strongly disagree regarding whether the adolescent views school as a central aspect of his/her life (e.g., doing well, valuing opinions of teachers; $\alpha = .66$). *Positive teaching qualities* is a five-item measure based on a 4-point Likert-type scale coded 1 = strongly agree… 4 = strongly disagree of youths' appraisals of their school environment; e.g., teaching is good, teachers are interested in students, grading and discipline are fair ($\alpha = .87$).

Analyses

Our analyses compared each indicator, separately and sometimes jointly, by multiply disadvantaged youth groups. For continuous indicators we tested differences between groups using analyses of variance (ANOVA) Chi square tests of association were applied for categorical variables. To test for differences across several dependent variables of health and well-being simultaneously as a function of multiply disadvantaged groups, we conducted multivariate analyses of variance (MANOVA) tests whenever the domain was solely comprised of continuous indicators. MANOVA is a conservative test of multiple outcomes that limits the risk of an inflated overall type I error rate (Hair 2006; Stevens 1996). For continuous indicators, we followed with post hoc tests to compare means group-to-group using Tukey adjusted alpha levels.

Results

Cumulative Disadvantage Sample Distributions

On the cumulative disadvantage index, 11.3 % reported none of the indicators, 15.3 % had one, 16.0 % had 2, 16.0 % had 3, 13.0 % had 4, 10.5 % had 5, 7.0 % had 6, 5.0 % had 7, 3.1 % had 8, and 2.7 % had 9 or more. Figure 1 portrays the distribution of cumulative disadvantage indicators across the three adolescent groups. The high disadvantaged group (5 or more), constituted by roughly a quarter of the sample, accounts for roughly 50 % or more of adolescents reporting discrimination and/or membership of vulnerable groups based on social, economic, racial and nativity status, with one exception. Being part of a single parent head of household is, by contrast, comparatively evenly distributed across the groups. Among youth reporting 0, 1, or 2 disadvantage indicators, the most common categories included single parent household, discrimination based on gender, and lower parental education. Based on the descriptive analysis the "stacking up" of disadvantage characteristics alongside discrimination experiences is strongly evidenced whereby youth in higher disadvantage group experience greater social and economic risks.

Group Comparisons Across Health and Functioning Domains

All ANOVA and Chi square tests for association results demonstrated statistically significant differences across

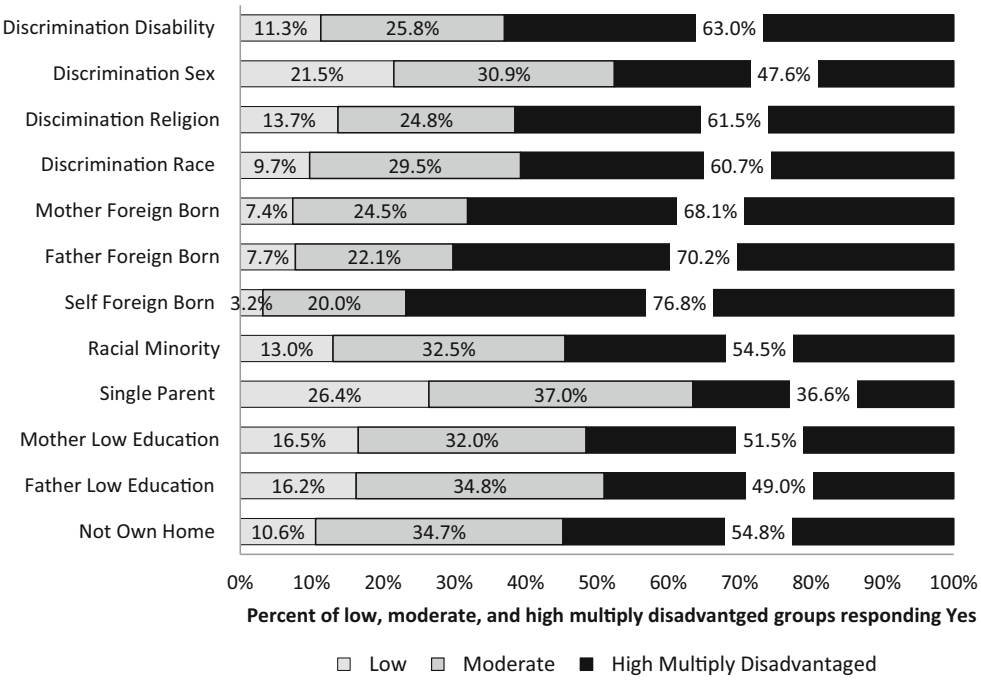

Fig. 1 Cumulative disadvantage indicator distributions for low (n = 4213), moderate (n = 2827), and highly (n = 2618) multiply disadvantaged youth groups

Table 1 Mean differences in physical and emotional health with different levels of cumulative disadvantage

	Multiply disadvantaged youth groups			
	Low (n = 4213)	Moderate (n = 2827)	High (n = 2618)	F or [χ^2]
Physical health				
Self-assessed physical health[a,b,c]	4.02	3.76	3.57	160.2***
BMI				
Under-weight	5.2 %	5.0 %	6.6 %	
Normal	70.3 %	64.8 %	64.0 %	[53.5]***
Overweight	17.4 %	18.9 %	19.9 %	
Obese	7.2 %	11.4 %	9.6 %	
Has smoked regularly				
Yes	13.5 %	20.7 %	18.1 %	[64.4]***
Dental				
Past year	85.4 %	72.5 %	60.7 %	[537.6]**
Within last 2 years	8.4 %	13.6 %	17.9 %	*
Longer than 2 years	6.1 %	13.9 %	21.5 %	
Emotional health	MANOVA F = 52.0***			
Self esteem[a,b,c]	3.2	3.1	3.0	135.4***
Internal locus of control[a,b,c]	3.2	3.2	3.1	74.9***
Optimistic about future[a,b,c]	3.24	3.13	3.07	49.5***

* $p < .05$; ** $p < .01$; *** $p < .001$

Tukey posthoc test for pairwise comparisons resulted in significant difference: [a] Between low and moderate multiply disadvantaged; [b] Between low and high multiply disadvantaged; [c] Between moderate and high multiply disadvantage

multiply disadvantaged groups. For domains that consisted of solely continuous variables, MANOVA test results were also significant. Results shown in Table 1 suggest indicators that comprise the physical health domain trend as expected when disadvantages accumulate for youth. In particular, self-assessed physical health suggests an

incremental increase with cumulative disadvantage, wherein each group significantly differed from the others in the anticipated directions, as evident by the declining magnitudes of the means and the Tukey post hoc pairwise test results. The frequency of reported recent dental visits also suggest stepped decline as disadvantages multiply. Obesity and smoking behavior, although generally trending as expected, were less fully stepped for both moderately and highly disadvantaged youth. For the emotional health domain, there is a consistent incrementally shifting pattern across self-esteem, internal locus of control, and optimism about the future.

ANOVA and Chi square tests in Table 2 attained statistical significance. The multiple dependent variables comprising family supports and peer assets domains also indicated statistically significant results as shown for the MANOVA tests. Again, Tukey post hoc tests indicate pairwise differences in the means for indicators in the family supports and peer assets domains, with magnitudes in the expected directions. One exception is the indicator for parental educational expectations where the means of the moderately and highly multiply disadvantaged youth are suggestive of a downward trend, but the pairwise test did not attain statistical significance. For the academic success domain, trends and tests demonstrate the expected associations for reported GPA, being held back a grade, and a rating of positive teaching qualities at school. Unanticipated, however, were the results for positive academic identify where youth with the highest disadvantage also reported the greatest positive academic identity.

Discussion

Our study indicates that the stacking of social statuses associated with marginalization—immigrant or domestic racial minority member, lower SES, status-based discrimination experiences—constitute powerful threats to lifetime developmental trajectories. By aggregating across these statuses, it becomes apparent that youth with more multi-form social disadvantages experience progressively greater risks through both poorer physical and emotional health. They also experience a greater paucity of social resources spanning family, peer, and academic life domains that might otherwise provide some buffering stress effects and foster healthy development. Buttressed by cumulative disadvantage and life course theories, we posit that these multi-form statuses tend to embed youth within life conditions where they are more likely to confront a wider array of stressors than their less disadvantaged peers; resulting in stress burdens that can overwhelm coping capacity, impair biological and emotional health, and foster proliferating cascades of struggle across domains important to development.

To develop our argument, we first explicate the social patterning of decrements in physical and emotional health evidenced in our study with increased disadvantage. Next, we discuss the observed erosion of family, peer, and academic resources also evidenced with growing disadvantage. Finally, we advocate for proactive and cross-sector collaborations to address both prevention and remediation of the pernicious effects of accumulated disadvantage on

Table 2 Mean differences in family support, peer assets, and academic success of youth with different levels of cumulative disadvantage

	Multiply disadvantaged youth groups			
	Low ($n = 4213$)	Moderate ($n = 2827$)	High ($n = 2618$)	F or [χ^2]
Family supports	MANOVA F = 82.1***			
Parental monitoring[a,b,c]	2.9	2.7	2.6	117.4***
Parental instrumental support[a,b,c]	2.7	2.5	2.5	106.7***
Parental educational expectations[a,b]	8.2	5.8	5.3	125.6***
Peer assets	MANOVA F = 138.5***			
Sense of belonging[a,b,c]	3.1	3.1	2.9	96.2***
Peers' aspirations[a,b,c]	4.0	3.8	3.6	252.3***
Feel safe among peers at school[a,b,c]	2.9	2.8	2.6	198.8***
Academic success				
GPA[a,b]	3.3	3.1	3.1	84.0***
Held back a grade	5.1 %	9.4 %	11.4 %	[95.0]***
Positive academic identity[b,c]	3.0	3.0	3.1	29.6***
Positive teaching qualities[a,b]	2.8	2.7	2.7	56.7***

* $p < .05$; ** $p < .01$; *** $p < .001$ Multivariate F Tests are tests of Wilks' Lambda

Tukey posthoc test for pairwise comparisons resulted in significant difference: [a] Between low and moderate multiply disadvantaged; [b] Between low and high multiply disadvantaged; [c] Between moderate and high multiply disadvantage

health. We highlight in particular the intersection of education and health, focusing on school-based initiatives to foster the development of individual resources for youth who experience multiple forms of disadvantage.

Physical and Emotional Health

The physical health indicators assessed in our study suggest multiple pathways through which greater social disadvantage in adolescence is likely to carry forward into adulthood. Patterns of poorer health indicators among multiply disadvantaged high school students extend reports of poorer health related to cumulative social disadvantage among younger children (Bauman et al. 2006) indicating a continued trend across adolescence. The fact that multiply disadvantaged youth report feeling less physically healthy suggests broader, possibly chronic health impairments in the making (Andresen et al. 2003), signaling the childhood roots of later health disparities (Shonkoff et al. 2009).

Although limited health data are available in this survey, higher levels of BMI and smoking, and more limited dental care among the moderate and high disadvantaged youth are consistent with pathways to later worsening health, such as adult obesity, diabetes, hypertension, periodontal disease, and respiratory diseases (McCarty et al. 2009), as well as cortisol reactivity—an indication of HPA dysregulation stemming from chronic stress exposure (Dockray et al. 2009). This pattern of physical health across a range of indicators reflects a social patterning of health inequalities, consistent with stress-load explanations of health weathering beginning in childhood (Braveman and Barclay 2009). Interventions focusing on health promotion among youth, such as obesity and substance abuse prevention, may be well-supported by attention to the roles of stress and cumulative risk exposure shaping health behaviors and biological dysregulation (Beydoun and Wang 2010; Wells et al. 2010).

Emotional health reflected a similar pattern through significantly lower levels of self-esteem, internal locus of control, and optimism about the future. This finding reflects aspects of a "double jeopardy" wherein individual psychosocial resources that could potentially buffer the effects of stressors to produce more positive outcomes are eroded or underdeveloped, leaving weak links in coping and resilience pathways (Aneshensel 2009; Matthews et al. 2010). More limited life control and constrained opportunities afforded to lower income, immigrant, and racial minority families may translate into more constrained circumstances for their children, and lower expectations of opportunities for personal control, advancement, or change of fortunes.

In addition to constraining healthy developmental resources, early life adversity associated with social disadvantage increases individuals' exposure to a variety of stressors that challenge psychological health and adaptive coping (Evans and Kim 2013) with increased probability of experiencing psychological problems in adulthood (Luo and Waite 2005). The stepped decrements across a range of indicators of physical and emotional health form a persuasive picture of the need for proactive and coordinated response by social workers and by allied professional, primary care, and community service providers to provide education about the relationship of chronic stress to health and to foster health promotive behaviors and resources.

Youth Resiliency Resources: Family, Peer and School

By and large, significant, consistent patterns were also observed across the family, peer, and academic domains. Elevated levels of cumulative disadvantage generate disparities in both stress exposure and coping responses, with implications for learning and educational outcomes. Lower income and more marginalized families, as well as schools, for example, experience multiple strains that adversely affect their capacities to provide the levels of monitoring, expectations, skills, and supports needed to optimize success of youth who are often already struggling with healthy development (Egerter et al. 2009). There interconnected effects of disadvantage exposure across these domains. For example, parenting style, effectiveness, and availability are eroded through parental exposure to chronic stress and disadvantage, with implications for child psychosocial and physical development (Evans and Kim 2013). In addition, disadvantaged children and youth are exposed to less "learning rich" school environments, less-qualified teachers, and more restrictive/chaotic school cultures (Willingham 2012). These trends are evident within our sample wherein higher disadvantaged youth report a lesser sense of parental involvement, parental and peer educational aspirations, peer belonging, school safety, and positive teaching. Decrements across these important resources indicate eroded social supports needed to buffer the effects of stress and promote positive development.

One pathway linking cumulative disadvantage with poor learning outcomes is through diminished self-regulatory and coping capacities. A paucity of buffering resources experienced both by parental caregivers and other important relationships such as teachers and school counselors can further contribute to maladaptive coping strategies and eroded self-regulatory capacities of youth. Self-regulation involves an interrelated complex set of processes such as self-control, delayed gratification, working memory, and planning (Evans and Kim 2013), that are collectively important in the cognitive and behavioral development needed in effective learning (Willingham 2012).

Differential educational resources and outcomes in adolescence are, in turn, predictive of poorer health in adulthood, constituting critical contributors in life-course disadvantage wherein health risks accumulate, resources are persistently lower, rates of illness and mortality are accelerated, and health disparities increase over time (Dupre 2008; Walsemann et al. 2008). In our study, differential educational outcomes were evidenced with multiply disadvantaged youth reporting less overall academic success, lower grades, and more than double the percentage of high disadvantaged versus low disadvantaged youth having been held back a grade.

The one exception to this stacked negative impact was youth self-beliefs about academic identity, with the most disadvantaged students reporting higher average levels. This result may be at least partially a function of a larger proportion of immigrant youth within the higher disadvantage group than the mid- and low groups. The overwhelming majority of immigrant parents hold high educational expectations of their children, and first- and second- generation youth are more likely to attend secondary education than third or higher generation peers, and effect that has been particularly evident among immigrant families from Asian origin (Glick and White 2004). Yet across all other indicators of academic success, multiply disadvantaged youth fared worse. Particularly given the roles of chronic stress and marginalization in undermining self-regulatory, coping, and cognitive performance abilities of youth, these lesser resources across family, school, and peer realms underscore the need for coordinated responding by social workers, educators, and related youth service-providers.

Limitations

The study sample is diverse, broadly representative for the Northwest region, includes a higher than typical proportion of students from immigrant families, and is based in communities with socioeconomic variation. In this respect, it provides an urban mix that is becoming increasingly typical. However, sampling from a single region leaves uncertain the extent to which findings are generalizable. Second, this sample was assessed in the final semester of high school. Those who have dropped-out, are schooled at home or at alternative or private institutions, who have graduated early, or are taking courses elsewhere are not represented in the sampling frame. Third, because the original study focus was on educational attainment and preparation for transition to adulthood, domains such as health and social supports were less extensively measured. Although consistent and significant patterns of findings emerged, reliance on largely unstandardized measures constitutes a limitation. These limitations suggest restraint when generalizing our current results to a broader population of high school seniors.

Implications and Conclusion

Stacked disadvantage is emblematic of chronic inequalities in children and youth's developmental contexts and in their transitions to adulthood. Factors such as low parental education, low family income, single parent family structure, racial minority, and immigrant status are not simply proxies for a single underlying disadvantage, but demonstrate here having additive effects on the life chances of youth. Our findings hold importance for consideration across a range of youth-service settings—such as educational, medical care, family service, mental health, and employment domains. The broad-spectrum patterning of compromised health and functioning for youth with higher cumulative disadvantage underscores the need for proactive assessment and potentially cross-setting preventive and remedial measures toward offsetting cascading of impairment.

Resiliency resources across domains of youths' relationships and contexts hold one level of opportunity to interrupt negative stress chains, and moving toward positive adaptation. Youth living in adversity do better when they possess good coping skills, resourcefulness, and optimism alongside supports to advance their visions and goals (Jaffee et al. 2007). For example, youths' positive future beliefs and optimism have been associated with greater positive psychosocial adaptation and coping in the face of chronic, cumulative stress (Wyman et al. 1993). Moreover, the ability to appraise stress in less threatening ways coupled with an optimistic or positive future outlook holds promise for dampening the negative effects of stress exposure not only cognitively, but evidenced in biological indicators of stress, e.g. reducing allostatic load (a marker of cumulative physiological risk) and dysregulated inflammatory response. Chen and colleagues (Chen and Miller 2012; Chen et al. 2012), for example, provide promising evidence that strategies such as "shift and persist"—positively reappraising stressors toward regulating negative emotion in combination with maintaining a future focus—buffer stress effects, thereby fostering health and functioning through both psychosocial and biological pathways; skills that can be developed and applied across contexts.

School-based initiatives may be one such place to hone and develop this skill set, alongside peer and family supports as assets to reinforce individual youth's visions and aspirations. There is a real need to help youth who are chronically stressed to target some of these other aspects of development, including emotion regulation, adaptive coping skills, and goal-setting, alongside learning and health

goals. Cumulative disadvantage and life-course perspectives provide guidance as to mechanisms of stress impact, better clarifying how risks accumulate and produce inequalities in health and development that increase over the life course. In particular, we have highlighted the intersection between educational and health inequalities; an important nexus for both the proliferation of disparities and targeted intervention to improve health and well-being. Indeed, research indicates the health benefits of increased education may be greatest for those youth who have lesser resources in other areas, including family assets (Ross and Mirowsky 2011).

At the same time, the buffering effect of education on health does not pan out equally. For example the health-education gradient is not equally enjoyed by African Americans compared to Whites with the same amount of education (Williams and Williams-Morris 2000). Blunted educational trajectories incur additional threats to later-life health through greater proliferation of health-undermining behaviors, like smoking and sedentary lifestyle, and depleted resource allotment, both of which, in turn, are unequally distributed based on social status memberships within multiple minority groups. Both the behavioral pathway and the sustained deprivation of economic resources pathways are implicated as mechanisms through which stacked disadvantages undermine adolescent health. In this way, whereas individual asset-building and coping approaches are needed to curb the effects of stress on health, other levels of intervention into systems that structure inequality is crucial. For youth who experience the effects of multiple, additive types of disadvantage, tailored intervention can provide much needed support, especially if scaffolded across multiple developmental contexts (e.g. family, school, community). At the same time, evidence of the compounded effects of stress on adolescent development and later life health, productivity, and longevity must be harnessed to direct broader service and policy efforts to support thriving among all adolescents.

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