Multiple Disadvantage and Discrimination: Implications for Adolescent Health and Education

Dana M. Prince, Anita Rocha, and Paula S. Nurius

Multiply disadvantaged youths exhibit worse health and academic success than their less disadvantaged peers, possibly due to greater exposure to social status-based discrimination. Models that capture the additive burden of disadvantage in tandem with multiple forms of discrimination are needed to explicate the unique and combined impact of these factors on adolescent health and academic outcomes. In addition, protective factors like positive family and peer relationships may attenuate these relationships. This study used data from the Beyond High School Study ($N = 9,658$), which looked at the transition to adulthood among senior class cohorts from 12 high schools in western Washington state, to investigate the influence of multiple disadvantage, four types of discrimination, and protective resources on student physical and mental health and school grades. Results show that both increased multiple disadvantage statuses and experienced discrimination are associated with decrements across outcomes; however, effects are attenuated when protective resources are considered. Yet, as disadvantages mount, the buffering effect of peer and family resources are dampened. No interaction was found between experienced discrimination and protective resources on outcomes.

KEY WORDS: *adolescence; education; experienced discrimination; health; multiple disadvantage*

Society is structured in ways that facilitate accumulation of advantage for some and disadvantage for others (Evans, 2004; Link & Phelan, 1995), with far-reaching effects of early disadvantage across the life course. Cumulative disadvantage can be both social (for example, experiences of marginalization based on social identities, such as race or ethnicity) and material (for example, poverty). Social status markers, including racial and ethnic minority, limited education, and immigrant status, are emblematic of an individual's positioning within larger structures of privilege and oppression. One type of stressor that has gained increasing attention as a contributor to physical and mental health disparities among adults and youths is social status-based discrimination (Priest et al., 2013; Williams & Mohammed, 2009). What remains less clear is how cumulative disadvantage and experienced discrimination collectively affect youths' physical and mental health and academic outcomes. Models that capture the additive burden of cumulative disadvantage in tandem with that of status-based discrimination are needed (Grollman, 2012). In this article, we draw on life-course-stress theory to

explicate the additive effects of multiple facets of social disadvantage and experiences of discrimination on physical and mental health and academic outcomes among a diverse sample of youths. We also hope to contribute to the literature by considering the role of protective factors, including positive family and peer supports, as buffers to the negative effects of social disadvantage and discrimination experiences. We conclude with a consideration of theoretical and intervention implications.

CUMULATIVE DISADVANTAGE, DISCRIMINATION, STRESS PROLIFERATION, AND HEALTH

Stress accumulation through exposure to multiple forms of social disadvantage constitutes a significant pathway through which social inequalities get "under the skin," generating biological cascades that run in tandem with health-eroding psychosocial trajectories across development (Ferraro & Shippee, 2009; Miller, Chen, & Cole, 2009). For example, accumulated social disadvantage carries direct stress effects like poverty-related deprivation (Aneshensel, 2009). In addition, social stress pathways are manifested through the proliferation of stressful roles, conditions, and

events associated with disadvantage, and the psychological distress accompanying these high-stress exposures (Pearlin, Schieman, Fazio, & Meersman, 2005). Social disadvantages, along with the subsequent stress that they catalyze, also serve to stymie access to and accumulation of resources that might otherwise help to offset the effects of stress on health and development. These stress-buffering resources include the interpersonal, such as family and community support, and the intrapersonal, such as optimism and a sense of efficacy or control (R. J. Turner & Avison, 2003). Depletion of coping resources is one pathway linking disadvantaged statuses to physical and emotional health vulnerability (McLeod & Owens, 2004).

Stress-process theory is increasingly focusing on the role of discrimination experiences as an explanatory mechanism for physical and mental health disparities between groups. Disadvantaged groups experience a disproportionate amount of discrimination (Grollman, 2014; Thoits, 2010). This combination is reflected in minority-stress theory (Meyer, 2003) and findings that minority and stigmatized groups experience both more stress and increased vulnerability to health problems (Sanders-Phillips, Kliever, Tirmazi, Von Nebbitt, & Key, 2014). For example, Grollman (2012) found that multiply disadvantaged youths experienced significantly greater exposure to discrimination, and that multiple forms of discrimination exposure significantly increased the odds of both emotional and physical health problems.

Even before children are fully aware of stigma and stratification norms, these forces are exerting influence on their health and development. Effects appear to amplify when youths become more fully aware of discrimination (Brown & Bigler, 2005; McKnown & Strambler, 2009). Racial and ethnic minority adolescent reports of racism from adults and peers are alarmingly high and increase significantly over time in conjunction with decrements in self-esteem and increased depressive symptoms. Moreover, those adolescents with the greatest exposure to discrimination exhibit an accelerated growth in depressive symptoms compared with peers with lesser exposure (Greene, Way, & Pahl, 2006).

Social status-based discrimination has been most often studied in terms of race- or ethnicity-based discrimination. However, there is growing support for, and interest in, broadening the scope of types of discrimination assessed in relation to health. In addition, there is a need to disentangle the effects of aggregate “counts” of disadvantage characteristics (for example,

belonging to a racial or ethnic minority group, poverty, and immigrant status) from actual reports of discrimination based on group memberships. Research suggests that individuals’ subjective perception of having *experienced* discrimination exerts a stronger negative effect on health than objective measures of discrimination (Singh-Manoux, Adler, & Marmot, 2003). Thus, more research is needed to examine the impact of multiple forms of experienced discrimination on youth health.

CUMULATIVE DISADVANTAGE, DISCRIMINATION, AND EDUCATION

Accrued social disadvantage may affect youth educational outcomes through several pathways, including resource deprivation; the clustering of underresourced schools in low-income neighborhoods; and the impact of less supportive parental, teacher, and other adult relationships on individual youths’ coping and adjustment. Youths who experience deficits in terms of stress-buffering resources, including supports from parental caregivers and teachers, may develop maladaptive coping strategies and eroded self-regulatory capacities. Self-regulation involves an interrelated set of processes such as working memory, planning, self-control, and delayed gratification (Evans & Kim, 2013) that pose important implications for the cognitive and behavioral development underlying effective learning (Willingham, 2012). Deficits in these areas may affect youth academic success over time.

A smaller body of work has investigated the impact of discrimination experiences (primarily based on race or ethnicity) in educational settings on adolescent academic and health outcomes. One of the pathways through which discrimination affects academic outcomes is vis-à-vis motivational and engagement capacities. Studies have found relationships between race-based discrimination and predictors of academic success including academic motivation (Alfaro, Umaña-Taylor, Gonzales-Backen, Bámaca, & Zeiders, 2009), school engagement (Neblett, Philip, Cogburn, & Sellers, 2006), and academic self-concept (Wong, Eccles, & Sameroff, 2003) among multiple adolescent racial and ethnic minority groups. Experiences of discrimination may cause youths to further internalize negative messages about their group and achievement, potentially activating stereotype threat and negatively affecting school performance (Walton & Cohen, 2007). In longitudinal work, earlier experiences of discrimination predicted later increases

in depressive symptoms and alienation, along with declines in school engagement and grades, signaling the immediate and sustained negative effects of such encounters (Benner & Kim, 2009).

School as a primary socializing context for adolescents and encounters with discrimination from peers, teachers, or other adult figures may negatively affect multiple realms of adolescent functioning. At the same time, there is some evidence to suggest that positive peer support may act as a buffer between discrimination experiences and decreases in social competency (Grossman & Liang, 2008). Given the primacy of peers and nonparental adults in adolescent development, school may be one promising place to locate resources and supports to intervene for multiply disadvantaged youths. Accumulated adversities pose pernicious pathways to physical and mental health problems in childhood (Nurius, Prince, & Rocha, 2015) and later life (Conroy, Sandel, & Zuckerman, 2010) and are similarly linked to curtailed educational opportunities (Haas & Fosse, 2008). Moreover, health and educational disparities are conjoint problems: Individuals with low education experience earlier onset and morbidity from chronic health conditions than peers with higher education (Dupre, 2008).

CURRENT STUDY

The current study examines the relationships among multiple disadvantage, discrimination experiences, supportive resources, and emotional and physical health and academic achievement in a diverse sample of high school seniors. The study highlights the unique and additive impacts of disadvantage and discrimination on important youth outcomes and also considers the role of protective factors in buffering these impacts. The four principal hypotheses of this study are that (1) youths with multiple disadvantage characteristics (for example racial or ethnic minority, immigrant status, socioeconomic status [SES]) will report significantly more types of social status-based discrimination experiences at greater frequency than their less disadvantaged peers; (2) increases in both social disadvantage characteristics and experienced discrimination will uniquely contribute to decreased physical and emotional health and academic success among youths, cumulatively exerting negative impacts; (3) family and peer resources will provide a unique positive contribution, as stress-buffering protective factors, to health and academic outcomes in the context of multiple disadvantage and discrimination experiences; and (4) these stress-buffering resources will interact with multiple disadvantage

status and experienced discrimination to attenuate the negative effects of disadvantage on youth emotional and physical health and academic grades.

METHOD

Data

We used data drawn from aggregating five survey waves ($N = 9,658$) of senior class cohorts from 12 high schools in western Washington state collected between 2000 and 2004, who participated in a study of educational attainment and transition to adulthood. Participants were recruited from class lists of students identified by each participating school as enrolled in their final semester of high school. All participants were surveyed within two months of commencement, after obtaining direct consent or (in the case of students under age 18) both direct assent and surrogate consent from a custodial parent or guardian. Surveys were self-administered. Participation was voluntary, with the nominal incentive of a movie pass on completion. There was a 70% response rate for completed surveys among enrolled high school seniors. With this relatively high level of participation, analyses for this study used listwise deletion due to missingness at random.

The average age of participants was 18 years, with 54.6% being female. Racial and ethnic self-identification by students reflected the following: non-Hispanic white (60.4%), African American (13.8%), Asian (13.2%), Hispanic (6%), Native Hawaiian and Pacific Islander (4.7%), 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 survey items pertaining to income. Therefore, we used home ownership as a proxy for SES in the analysis: 67.7% had parents who owned their home, 32.3% did not.

Measures

Multiple Disadvantages. We treated multiple disadvantage as a summative count of eight indicators of social and economic disadvantage in line with prior research assessing cumulative forms of disadvantage (Appleyard, Egeland, van Dulmen, & Sroufe, 2005; Bauman, Silver, & Stein, 2006). Indicators included race or ethnicity (white as majority group coded 0, African American, Native American, Asian American, Hawaiian/Pacific Islander, and Hispanic as racial or ethnic minority groups each coded 1), immigrant

status (self, 0 = no, 1 = yes; father, 0 = no, 1 = yes; and mother, 0 = no, 1 = yes), and low-income indicators including home ownership (yes = 0, no = 1), both father's and mother's level of education (high school diploma or less = 1, more than high school diploma = 0), and household structure (single-parent = 1, two-parent = 0). The overall mean for multiple disadvantage was 2.44 ($SD = 1.94$), with a range from zero to eight.

Experienced Discrimination. Participants were asked, "Have you ever experienced prejudice or discrimination based on your . . ." followed by "race or ethnicity," "nationality or religion," "gender," and "physical or mental disability." Response categories—never, rarely, sometimes, and often—were dichotomized (1 = yes, 0 = no) and a summative count of the four dichotomized items, ranging from zero to four, was calculated. The mean score for experienced discrimination was 1.76 ($SD = 1.30$).

Health and Education Outcomes

Self-Assessed Physical Health. Subjective physical health is based on a single item, "In general, how good is your health?" rated on a five-point Likert-type scale ranging from 1 = poor to 5 = excellent. Self-rated health is widely used as a measure of objective health states and has been found to be predictive of mortality (Jylhä, Volpato, & Guralnik, 2006) and adult disability or disease burden (Sadana, 2000).

Emotional Health. We created a mean-based index of three measures: (1) self-esteem is a seven-item measure based on Rosenberg's (1965) Self-Esteem Scale reflecting sense of self-worth ($\alpha = .69$), (2) locus of control is a five-item measure of youths' perception of sense of control ($\alpha = .61$), and (3) optimism about future is a single-item question: "I feel hopeful about the future." Each of these measures used a common metric (4 = strongly agree to 1 = strongly disagree).

Grade Point Average. Grade point average as a conventional indicator of academic success was assessed on an eight-point self-reported scale (ranging from 1 = mostly below Ds to 8 = mostly As).

Protective Assets

To create a broad index of youth assets, we took an approach similar to our additive multiple disadvantage indexing by combining measures across types of assets. This approach has been used to create cumulative health promotion or protective factor indexes in

previous research (for example, Ostaszewski & Zimmerman, 2006; M. G. Turner, Hartman, Exum, & Cullen, 2007). We standardized measures to address differential metrics, resulting in z scores rescaled to have a mean of zero and a standard deviation of one. We then added across the z scores to create the peer and family indexes.

Peer Resources. This index is the sum of three rescaled measures—peer belonging at school, peer educational aspirations, and school safety—and has a mean of zero ($SD = 2.01$) and a range from -9.28 to 5.46 . The original metrics for each measure are as follows: peer belonging was a four-item measure of youths' perceptions of their ability to relate to peers at school (for example, "I see myself as not fitting in") and perceptions of how their peers view them (for example, "Kids at school see me as not fitting in") based on a four-point Likert-type scale ranging from 1 = strongly agree to 4 = strongly disagree ($\alpha = .75$). Peer educational aspirations was a six-item mean-based measure of peers' post high school plans, such as "How many of your high school friends left high school without graduating?" Other items captured postsecondary plans including work, military service, vocational school, or four-year college. Responses ranged from 1 = none or some to 5 = most or all ($\alpha = .72$). Original safe learning environment is a three-item mean-based measure of youths' appraisals of school safety; for example, "I don't feel safe in this school," "Disruptions by other students get in the way of my learning," and "Fights often occur between different racial or ethnic groups" based on a four-point Likert-type scale ranging from 1 = strongly agree to 4 = strongly disagree ($\alpha = .64$).

Family Resources. This index is the sum of standardized versions of the following four measures and has a mean of zero ($SD = 2.73$) and ranges in value from -10.92 to 6.31 . (1) Original family connection is a four-item mean-based measure based on a four-point Likert-type scale ranging from 1 = strongly agree to 4 = strongly disagree including items like "I receive high levels of love and support from family members" ($\alpha = .78$). (2) Parental monitoring is a two-item mean-based measure constructed on a four-point Likert-type scale ranging from 1 = strongly agree to 4 = strongly disagree (of parental knowledge of their friends and their friends' parents) ($\alpha = .72$). (3) Parental instrumental help with school is a five-item mean-based frequency measure (ranging from 1 = not often to 4 = often) capturing youth assessments of how often parents help with homework

and talk to them about school-related activities, including higher education ($\alpha = .67$). (4) Parental educational aspirations is a summative measure of mother's and father's educational expectations for youth, ranging from 1 = less than high school diploma to 7 = PhD.

Analysis

To characterize the relationship between discrimination experiences and multiple disadvantages detailed in hypothesis 1, we estimated the relative risk ratios (RRRs) from multinomial logistic regression models where the dependent variable is the level of perceived discrimination—never (as the reference category), rarely, sometimes, or often—for each type. Because tests of parallel lines on our data suggested we were in violation of the proportional odds assumption necessary for ordinal logistic regression models, we adopted the multinomial logistic regression model, where no such constraint is assumed. The independent variable is the multiple disadvantages index (grouped by low = 0–2 as the reference category, medium = 3–4, or high = 5 or more). This analysis was conducted to characterize how experiences of discrimination relate to multiple disadvantage status among this sample of youths. Next, we conducted a series of ordinary least squares regression analyses to examine hypotheses 2 through 4. For hypothesis 2, we tested the direct effects of multiple disadvantage on physical health, emotional health, and grades. Next, we added the measure of experienced discrimination to the model and examined its association with health and academic outcomes. To address hypothesis 3, we augmented the model by adding the peer and family resources measures to assess changes in magnitude of these relationships in the context of disadvantage and discrimination. Finally, for hypothesis 4, we tested the moderating effect of peer and family resources with multiple disadvantage and discrimination on physical health, emotional health, and grades.

RESULTS

Descriptive Statistics

Among this sample of high school seniors, 18% reported no disadvantage characteristics, 19% reported one, 18% two, 17% three, 12% four, and 16% five or more disadvantages. In regard to discrimination experiences, 57% reported experiencing no forms of discrimination, 20% experienced one form, 14%

two forms, 8% three, and 2% four forms of discrimination. The majority of high school seniors in this sample reported good, very good, or excellent health at 27%, 34%, and 30%, respectively, whereas a lesser proportion reported poor and fair health, 1% and 9%, respectively. The emotional health index, with a range from 1 to 4, has a mean of 3.15 and a standard deviation of 0.43. Few students reported average grades of Cs (7%) or below C (4%); many more reported average grades of Bs and Cs (20%), mostly Bs (17%), As and Bs (30%), or mostly As (24%).

RRRs. Hypothesis 1 examines the discrimination items in relation to a student's race, nationality or religion, gender (analyzed separately for female and male youths), and disability in relation to multiple disadvantages (see Table 1). RRRs for race discrimination were statistically significant and higher (greater than 1.0) for youths in the medium and high disadvantage groups compared with youths in the low disadvantage group. The RRRs tended to increase with greater disadvantage; for example, the relative risk of experiencing racial discrimination often or sometimes was nearly four times higher for youths in the high disadvantage group compared with those in the low. For youths in the medium disadvantage group, the relative risk was nearly two times higher. We saw a similar pattern for discrimination based on nationality or religion. Again, all levels of discrimination were statistically significant and higher (greater than 1.0) for youths with increased levels of disadvantage. Those in the high disadvantage group were nearly twice as likely to encounter discrimination based on nationality or religion compared with those in the low disadvantage group. A similar, yet weaker, relationship was evidenced for youths who reported discrimination based on physical or emotional disability. In contrast, discrimination based on gender told a different story. For young women, the RRRs were less than one for the higher disadvantage groups, indicating that perceived gender-based discrimination is significantly lower for these young women compared with their less disadvantaged counterparts. Of note, young men's reports of gender-based discrimination by and large did not attain significance. Young men, regardless of disadvantage status, appeared to not experience significantly different levels of gender-based discrimination.

Regression Analyses: Emotional Health, Physical Health, and Grades. The direct effects of multiple disadvantage and discrimination on the outcomes—emotional health, self-reported physical health, and

Table 1: Estimated Relative Risk Ratios in Multinomial Logistic Regression Models for Types of Experienced Discrimination, by Level of Disadvantage

Discrimination based on . . .	Response	Multiple Disadvantage Groups ^a			
		Medium (3–4)		High (5+)	
		RRR	[95% CI]	RRR	[95% CI]
Race ^b (<i>n</i> = 9,274)	Rarely	1.67***	[1.49, 1.87]	2.50***	[2.16, 2.91]
	Sometimes	2.37***	[2.09, 2.69]	3.92***	[3.35, 4.59]
	Often	2.87***	[2.33, 3.52]	3.82***	[2.96, 4.92]
Nationality or religion ^b (<i>n</i> = 9,274)	Rarely	1.36***	[1.22, 1.53]	2.02***	[1.75, 2.33]
	Sometimes	1.49***	[1.31, 1.70]	2.84***	[2.44, 3.32]
	Often	1.86***	[1.49, 2.32]	2.81***	[2.16, 3.66]
Gender for female youths ^b (<i>n</i> = 5,160)	Rarely	0.73***	[0.63, 0.85]	0.55***	[0.46, 0.66]
	Sometimes	0.66***	[0.56, 0.78]	0.51***	[0.41, 0.62]
	Often	0.84	[0.60, 1.17]	0.90	[0.61, 1.32]
Gender for male youths ^b (<i>n</i> = 4,120)	Rarely	0.83*	[0.70, 0.99]	0.93	[0.76, 1.15]
	Sometimes	1.05	[0.83, 1.31]	0.87	[0.64, 1.18]
	Often	1.46*	[1.01, 2.12]	1.45	[0.92, 2.28]
Physical/emotional disability ^b (<i>n</i> = 9,256)	Rarely	1.10	[0.94, 1.28]	1.41***	[1.18, 1.70]
	Sometimes	1.38**	[1.11, 1.72]	1.81***	[1.42, 2.32]
	Often	1.66**	[1.23, 2.23]	1.56*	[1.07, 2.26]

Notes: RRR = relative risk ratios; CI = confidence interval.

^aReferent = low (0–2 disadvantages).

^bReferent = never.

*p < .05. **p < .01. ***p < .001.

Table 2: Direct Effect of Multiple Disadvantages, Experienced Discrimination, and Peer and Family Resources on Emotional Health, Physical Health, and Academic Grades

Predictor ^a	Emotional Health (<i>n</i> = 9,113)		Physical Health (<i>n</i> = 9,120)		Grades (<i>n</i> = 9,134)	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Gender (male)	0.08***	0.03***	−0.15***	−0.17***	0.20***	0.18***
Multiple disadvantage	0.16***	−0.02***	−0.14***	−0.06***	−0.14***	−0.17***
Experienced discrimination	−0.09***	0.00	−0.15***	−0.10***	−0.04***	0.01
Family resources		0.28***		0.14***		0.14***
Peer resources		0.35***		0.18***		0.18***
<i>R</i> ^{2b}	0.05***	0.27***	0.07***	0.13***	0.06***	0.12***
<i>F</i>	142.5	686.7	229.3	276.2	198.1	249.0

Note: Reference category in parentheses.

^aStandardized coefficient estimates.

^b*R*² test of significance based on an *F*-change statistic comparing nested models.

***p ≤ .001.

grades—are represented in Table 2. Being female was positively associated with a higher reported emotional health and grades compared with being male, yet being female was negatively associated with self-reported physical health compared with being male. Multiple disadvantage was consistently negatively associated with emotional health, self-reported physical health, and grades. The protective factors of family and peer resources modeled in hypothesis 4 had a positive association with increasing emotional health, self-reported physical health, and grades. Experienced discrimination, when significant, was negatively associated with

emotional health, self-reported physical health, and grades, but was nonsignificant for emotional health or grades when family or peer assets were included in the model.

Moderating Effects of Protective Resources. Moderating effects of hypothesis 4 were added to the multiple regression models, and their coefficient estimates are shown for emotional health, self-reported physical health, and grades in Table 3. As in the previous models, being female and increasing disadvantages were consistently statistically significant across all outcomes and in the same directions as in the models with only

Table 3: Interaction Effects of Family and Peer Resources with Multiple Disadvantage and Experienced Discrimination

Predictor	Emotional Health	Physical Health	Grades
Family resources	0.48***	0.26***	0.28***
Multiple disadvantage	−0.07***	−0.09***	−0.09***
Family resources × multiple disadvantage	−0.12***	−0.07***	−0.11***
Family resources	0.38***	0.20***	0.21***
Experienced discrimination	−0.07***	−0.14***	−0.03**
Family resources × experienced discrimination	0.01	−0.01	−0.02
Peer resources	0.47***	0.26***	0.27***
Multiple disadvantage	−0.07***	−0.09***	−0.09***
Peer resources × multiple disadvantage	−0.04**	−0.04*	−0.06***
Peer resources	0.45***	0.23***	0.24***
Experienced discrimination	0.00	−0.10***	0.01
Peer resources × experienced discrimination	−0.02	−0.01**	−0.03*

Notes: $n = 9,113$ to $9,137$. All models used standardized coefficients and controlled for gender, multiple disadvantage, and experienced discrimination, whether reported or not.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Figure 1: Predicted Values of Emotional Health by Cumulative Disadvantage

direct effects. In the model for emotional health (see Table 3), the term representing the interaction of family resources and multiple disadvantage is negative ($-0.12, p \leq .001$), indicating that as disadvantages accumulate the protective factor of family resources may be less able to compensate for its impact on students' emotional health. Figure 1 illustrates, for example, that youths with family resources at the 75th percentile have the highest emotional health levels when their disadvantage level is low, but the rate of declining

emotional health is steepest in this group as disadvantages accumulate, possibly eroding whatever protective role family resources may play. In contrast, those at the 25th percentile of family resources realize fewer and relatively undifferentiated gains in emotional health across the entire disadvantage spectrum. Although smaller in magnitude, similar moderation appears with the interaction of peer resources and disadvantage ($-0.04, p \leq .01$).

Family resources similarly moderate the association between multiple disadvantage and self-reported physical health, suggesting lesser effects on physical health as disadvantages accumulate (see Table 3). Moreover, peer resources moderate the association of both disadvantage and experienced discrimination with regard to self-reported physical health. A consistent pattern of moderation is evident in academic grades (see Table 3). Whereas family resources moderate the association between multiple disadvantage and grades, peer resources moderate the association between both disadvantage and discrimination pertaining to grades.

DISCUSSION

When the distribution of health, protective resources, and discrimination experiences are considered across disadvantage groups, there is significant evidence of how the "stacking up" of disadvantages affects youth health and education. In line with hypothesis 1, higher endorsements of each discrimination type were significantly more likely among youths in the high multiple disadvantage group. This pattern maps onto previous research showing that the burden

of discrimination experiences falls heaviest on those youths who hold multiple devalued social statuses. The one notable exception here is a possible trend in differential experience of gender-based discrimination as a function of multiple disadvantage. In our study, less disadvantaged girls were more likely to report gender-based discrimination compared with their more disadvantaged female counterparts. Male youths' levels of reporting were relatively flat across groups, although there was a slight tendency to endorse *more* gender-based discrimination as disadvantage increased. Some research with racial and ethnic minority youths has found that male youths reported higher rates of gender- and race-based discrimination than their female counterparts (Cogburn, Chavous, & Griffin, 2011). In our sample, exploratory chi-square analysis showed significant differences between racial groups on reports of gender-based discrimination across genders. Both African American young men and women reported greater experience of gender-based discrimination (16%) relative to their overall representation in the sample (14%). These preliminary findings point to the importance of an intersectional approach to understand the complex interplay of identity and discrimination-based experiences for youths who experience multiple forms of social and economic disadvantage, particularly in regard to gender.

In support of our research hypothesis 2, accumulated social disadvantages contribute uniquely to decreased physical and emotional health and weakened academic success among youths. In addition, greater experiences of social status-based discrimination incur additional health-weakening effects beyond the contribution of disadvantage statuses, highlighting the unique contribution of discrimination experience. Less robust physical health and early acquisition of poor health behaviors sets the stage for health-weathering processes that accelerate chronic disease formation (Geronimus, Hicken, Keene, & Bound, 2006). Reduced emotional health in adolescence, including impaired self-esteem, self-efficacy, and hopefulness, potentially undermines youths' sense of autonomy, subsequent educational and work success, and formation of healthy intimate relationships, in addition to contributing to later psychopathology such as depression (Walsemann, Geronimus, & Gee, 2008).

It is possible that part of what we are seeing in regard to emotional health is "low reserve capacity" for multiply disadvantaged youths. Reserve capacity is one

explanatory pathway between disadvantage and health. In the context of material deprivation, individuals may have reduced psychosocial coping resources, operationalized in a variety of ways including optimism, self-esteem, and social supports, which limit coping capacities (Matthews & Gallo, 2011; Matthews, Gallo, & Taylor, 2010). In our study, emotional health was operationalized through "reserve" terms—"optimism," "self-esteem," and "locus of control." Depleted reserve capacity for handling chronic stressors may lead to physical health vulnerabilities in adulthood. According to a recent review, control beliefs are particularly potent in the link between disadvantage and declining health outcomes (Matthews et al., 2010). Youths who are situated at the nexus of multiple devalued social statuses may feel less in control of their futures than others, incurring a sense of learned helplessness that is also linked to poor mental and physical health outcomes.

In a similar pattern, accrued disadvantage and discrimination experiences were negatively associated with academic grades. Depleted reserve capacity may also affect academic grades through a lack of social support resources, including those from parents and teachers. Those youths who struggle in school may also be facing systemic barriers to educational achievement including worse school readiness and cascading effects of worse academic outcomes. School success is cumulative; early disadvantages play out in an ever-widening gap between multiply disadvantaged youths and their more affluent or privileged counterparts. In addition, the role of discrimination as an additional stressor may affect youths' academic success through depleted motivation, engagement, and weakened academic self-concept. The concurrent effects of discrimination from peers and nonparental adults on adolescent grades and markers of mental health may also signal the dynamic interplay between internalizing problems and achievement (Vaillancourt, Brittain, McDougall, & Duku, 2013). For example, depression and other mental health problems may affect students' ability to sustain focus and manage academic tasks, thus affecting performance.

In support of hypothesis 3, family and peer resources positively predicted physical and emotional health and academic success. In addition, inclusion of these resources in the model decreased the strength of the relationship between social statuses and discrimination with all outcomes. Perhaps more telling, experienced discrimination no longer significantly predicted declines in emotional health or grades when resources were

included yet remained statistically significant for self-reported physical health when adjusting for peer assets. This may suggest that the protective offset of peer assets is most salient in countering discrimination experiences for particular outcomes. Notably, peer resources exhibit a stronger protective relationship to physical and emotional health and academic well-being compared with family resources. The peer resources domain provides a window into adolescents' peer environments, which are powerfully shaping forces during this stage. School-based interventions may, therefore, be particularly well suited to bolster positive youth development, in terms of both health and academics, through developing supportive and harmonious relationships among students. Positive youth development approaches illuminate the importance of context to scaffold success highlighting individual strengths that, when aligned with developmental assets in families, schools, and communities, are linked to thriving (Schmid et al., 2011).

Finally, hypothesis 4 tested the moderating effect of resources with disadvantage and discrimination on health and grades. Despite the positive benefit of protective resources, both family and peer resources interacted with multiple disadvantage on each outcome. The result, however, was not as anticipated. As disadvantaged statuses accumulated, the relative protective capacity of both family and peer resources on physical and emotional health and academics was weakened.

Overall, our results show that increased experiences of four types of status-based discrimination incurred additional depletion of adolescent mental, physical, and school health above and beyond those experienced by disadvantage alone. These findings relate to previous research with multiple disadvantage youths (Grollman, 2012). Notably, when family and peer resources are included in the model, the association with decreased emotional health is no longer significant. Peer resources did interact with discrimination in relation to academic success, but not in the way we anticipated: As youths experience more discrimination, the protective effect of peer resources is dampened.

In our study, the relative benefit of peer support became muted with mounting social disadvantage and experienced discrimination. These findings highlight the role of protective resources, which can serve as buffers against the harmful impact of accumulated status-based disadvantage and discrimination for adolescent well-being. At the same time, for youths who experience compounded, additive disadvantages, the relative benefit of social supports may be overwhelmed.

For some youths, further attentive scaffolding of protective resources, particularly across domains (for example, school, family, and neighborhood), will be necessary to extract the needed buffering effect.

Study Limitations

A few study limitations should be noted. First, the analysis was cross-sectional, thereby limiting certainty of causation. Other work, however, has demonstrated causal relationships between social disadvantage factors such as those included in our analyses and lower health and functioning outcomes, which strengthens our interpretation of causal linkages. Second, although the study sample is representative of the Pacific Northwest region, including considerable diversity, the sample characteristics will vary from those of other regions. There is, for example, a lower proportion of African Americans and a higher proportion of immigrant families than in other major urban areas. These variations in demography should not, however, serve to alter the nature of linear trends underlying findings reported here, arguing for broad-based generalizability.

Third, in addition to social disadvantage factors, a cumulative life course approach often includes childhood adversity stress exposures such as family turmoil, significant losses, and maltreatment, which carry significant implications for concurrent and later-life health (Edwards, Holden, Felitti, & Anda, 2003; Raposa, Hammen, Brennan, O'Callaghan, & Najman, 2014). Although such phenomena are not directly captured in our data, youths living in more socially disadvantaged circumstances also tend to have greater interpersonal adverse experiences (Evans, 2004). The current findings, thus, likely implicitly capture some degree of these types of adverse childhood experiences, but additive or effects beyond social disadvantage cannot be determined from the existing data. Finally, additional forms of discrimination experience, specifically perceived sexual orientation and weight-based discrimination, should be assessed. Youths who are lesbian, gay, bisexual, or transgender are targeted in identity-based discrimination and bullying at alarmingly high rates (Kosciw, Greytak, Bartkiewicz, Boesen, & Palmer, 2012). Youths who are overweight or obese also face greater stigmatization and discrimination, with significant implications for mental health (Puhl & Latner, 2007). In addition, more proximal measures of experienced discrimination (for example, number of times in the past month or past year) would allow for investigation into the severity of exposure.

Conclusion

This research offers critical insight into how multiple disadvantage and discrimination experiences contribute to youth health and education in the presence of key protective resources. Inclusion of protective resources is necessary to determine how these factors may mitigate some of the negative effects of disadvantage on young people's health. Although discrimination experience, in terms of both number and severity, is a demonstrated pathway to adverse health and functioning outcomes across the life course, in the present study the negative effects were dampened or eliminated entirely when protective assets were accounted for, signaling the promise of youth asset-building approaches to curb the negative effects of stress on health and education. At the same time, mounting social disadvantage continued to exert influence on youth outcomes, even when peer and family supports were included, highlighting the need for systems-level interventions to curb the proliferating effects of inequality. For youths who experience the effects of multiple, additive types of disadvantage, tailored intervention can provide much-needed support, especially if scaffolded across multiple developmental contexts (for example, family, school, community). At the same time, further illumination of the compounded effects of stress on adolescent development and later-life health, productivity, and longevity must be harnessed to direct broader policy efforts to transform how institutions, communities, and neighborhoods can support thriving among all adolescents. **SWR**

REFERENCES

- Alfaro, E. C., Umaña-Taylor, A. J., Gonzales-Backen, M. A., Bámaca, M. Y., & Zeiders, K. H. (2009). Latino adolescents' academic success: The role of discrimination, academic motivation, and gender. *Journal of Adolescence*, 32, 941–962. doi:10.1016/j.adolescence.2008.08.007
- Aneshensel, C. S. (2009). Toward explaining mental health disparities. *Journal of Health and Social Behavior*, 50, 377–394. doi:10.1177/002214650905000401
- Appleyard, K., Egeland, B., van Dulmen, M.H.M., & Sroufe, L. A. (2005). When more is not better: The role of cumulative risk in child behavior outcomes. *Journal of Child Psychology and Psychiatry*, 46, 235–245. doi:10.1111/j.1469-7610.2004.00351.x
- Bauman, L. J., Silver, E. J., & Stein, R. E. (2006). Cumulative social disadvantage and child health. *Pediatrics*, 117, 1321–1328. doi:10.1542/peds.2005-1647
- Benner, A. D., & Kim, S. Y. (2009). Experiences of discrimination among Chinese American adolescents and the consequences for socioemotional and academic development. *Developmental Psychology*, 45, 1682–1694.
- Brown, C. S., & Bigler, R. S. (2005). Children's perceptions of discrimination: A developmental model. *Child Development*, 76, 533–553. doi:10.1111/j.1467-8624.2005.00862.x
- Cogburn, C. D., Chavous, T. M., & Griffin, T. M. (2011). School-based racial and gender discrimination among African American adolescents: Exploring gender variation in frequency and implications for adjustment. *Race and Social Problems*, 3(1), 25–37. doi:10.1007/s12552-011-9040-8
- Conroy, K., Sandel, M., & Zuckerman, B. (2010). Poverty grown up: How childhood socioeconomic status impacts adult health. *Journal of Developmental and Behavioral Pediatrics*, 31, 154–160. doi:10.1097/DBP.0b013e3181c21a1b
- Dupre, M. E. (2008). Educational differences in health risks and illness over the life course: A test of cumulative disadvantage theory. *Social Science Research*, 37, 1253–1266. doi:10.1016/j.ssresearch.2008.05.007
- Edwards, V. J., Holden, G. W., Felitti, V. J., & Anda, R. F. (2003). Relationship between multiple forms of childhood maltreatment and adult mental health in community respondents: Results from the Adverse Childhood Experiences Study. *American Journal of Psychiatry*, 160, 1453–1460. doi:10.1176/appi.ajp.160.8.1453
- Evans, G. W. (2004). The environment of childhood poverty. *American Psychologist*, 59, 77–92. doi:10.1037/0003-066X.59.2.77
- Evans, G. W., & Kim, P. (2013). Childhood poverty, chronic stress, self-regulation, and coping. *Child Development Perspectives*, 7(1), 43–48. doi:10.1111/cdep.12013
- Ferraro, K. F., & Shippee, T. P. (2009). Aging and cumulative inequality: How does inequality get under the skin? *Gerontologist*, 49, 333–343. doi:10.1093/geront/gnp034
- Geronimus, A. T., Hicken, M., Keene, D., & Bound, J. (2006). "Weathering" and age patterns of allostatic load scores among blacks and whites in the United States. *American Journal of Public Health*, 96, 826–833. doi:10.2105/AJPH.2004.060749
- Greene, M. L., Way, N., & Pahl, K. (2006). Trajectories of perceived adult and peer discrimination among black, Latino, and Asian American adolescents: Patterns and psychological correlates. *Developmental Psychology*, 42, 218–238. doi:10.1037/0012-1649.42.2.218
- Grollman, E. (2012). Multiple forms of perceived discrimination and health among adolescents and young adults. *Journal of Health and Social Behavior*, 53, 199–214. doi:10.1177/0022146512444289
- Grollman, E. (2014). Multiple disadvantaged statuses and health: The role of multiple forms of discrimination. *Journal of Health and Social Behavior*, 55, 3–19. doi:10.1177/0022146514521215
- Grossman, J. M., & Liang, B. (2008). Discrimination distress among Chinese American adolescents. *Journal of Youth and Adolescence*, 37, 1–11. doi:10.1007/s10964-007-9215-1
- Haas, S. A., & Fosse, N. E. (2008). Health and educational attainment of adolescents: Evidence from the NLSY97. *Journal of Health and Social Behavior*, 49, 178–192.
- Jylhä, M., Volpato, S., & Guralnik, J. M. (2006). Self-rated health showed a graded association with frequently used biomarkers in a large population sample. *Journal of Clinical Epidemiology*, 59, 465–471. doi:10.1016/j.jclinepi.2005.12.004
- Kosciw, J. G., Greytak, E. A., Bartkiewicz, M. J., Boesen, M. J., & Palmer, N. A. (2012). *The 2011 National School Climate Survey: The experiences of lesbian, gay, bisexual and transgender youth in our nation's schools*. New York: GLSEN.

- Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. *Journal of Health and Social Behavior, extra issue*, 80–94. doi:10.2307/2626958
- Matthews, K. A., & Gallo, L. C. (2011). Psychological perspectives on pathways linking socioeconomic status and physical health. *Annual Review of Psychology*, 62, 501–530. doi:10.1146/annurev.psych.031809.130711
- Matthews, K. A., Gallo, L. C., & Taylor, S. E. (2010). Are psychosocial factors mediators of socioeconomic status and health connections? *Annals of the New York Academy of Sciences*, 1186(1), 146–173. doi:10.1111/j.1749-6632.2009.05332.x
- McKnown, C., & Strambler, M. J. (2009). Developmental antecedents and social and academic consequences of stereotype-consciousness in middle childhood. *Child Development*, 88, 1643–1659. doi:10.1111/j.1467-8624.2009.01359.x
- McLeod, J. D., & Owens, T. J. (2004). Psychological well-being in the early life course: Variations by socioeconomic status, gender, and race/ethnicity. *Social Psychology Quarterly*, 67, 257–278. doi:10.1177/019027250406700303
- Meyer, I. H. (2003). Prejudice as stress: Conceptual and measurement problems. *American Journal of Public Health*, 93, 262–265. (PMID: 12554580)
- Miller, G., Chen, E., & Cole, S. W. (2009). Health psychology: Developing biologically plausible models linking the social world and physical health. *Annual Review of Psychology*, 60, 501–524. doi:10.1146/annurev.psych.60.110707.163551
- Neblett, E. W., Jr., Philip, C. L., Cogburn, C. D., & Sellers, R. M. (2006). African American adolescents' discrimination experiences and academic achievement: Racial socialization as a cultural compensatory and protective factor. *Journal of Black Psychology*, 32, 199–218. doi:10.1177/0095798406287072
- Nurius, P. S., Prince, D. M., & Rocha, A. (2015). Cumulative disadvantage and youth well-being: A multi-domain examination with life course implications. *Child and Adolescent Social Work Journal*, 32, 567–576. doi:10.1007/s10560-015-0396-2
- Ostaszewski, K., & Zimmerman, M. A. (2006). The effects of cumulative risks and promotive factors on urban adolescent alcohol and other drug use: A longitudinal study of resiliency. *American Journal of Community Psychology*, 38, 237–249. doi:10.1007/s10464-006-9076-x
- Pearlin, L. I., Schieman, S., Fazio, E. M., & Meersman, S. C. (2005). Stress, health, and the life course: Some conceptual perspectives. *Journal of Health and Social Behavior*, 46, 205–219. doi:10.1177/002214650504600206
- Priest, N., Paradies, Y., Trener, B., Truong, M., Karlsen, S., & Kelly, Y. (2013). A systematic review of studies examining the relationship between reported racism and health and wellbeing for children and young people. *Social Science & Medicine*, 95, 115–127. doi:10.1016/j.socscimed.2012.11.031
- Puhl, R. M., & Latner, J. D. (2007). Stigma, obesity, and the health of the nation's children. *Psychological Bulletin*, 133, 557–580. doi:10.1037/0033-2909.133.4.557
- Raposa, E. B., Hammen, C. L., Brennan, P. A., O'Callaghan, F., & Najman, J. M. (2014). Early adversity and health outcomes in young adulthood: The role of ongoing stress. *Health Psychology*, 33, 410–418. doi:10.1037/a0032752
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Sadana, R. (2000). Measuring reproductive health: Review of community-based approaches to assessing morbidity. *Bulletin of the World Health Organization*, 78, 640–654.
- Sanders-Phillips, K., Kliever, W., Tirmazi, T., Von Nebbitt, T. C., & Key, H. (2014). Perceived racial discrimination, drug use, and psychological distress in African American youth: A pathway to child health disparities. *Journal of Social Issues*, 70, 279–297. doi:10.1111/josi.12060
- Schmid, K. L., Phelps, E., Kiely, M. K., Napolitano, C. M., Boyd, M. J., & Lerner, R. M. (2011). The role of adolescents' hopeful futures in predicting positive and negative developmental trajectories: Findings from the 4-H Study of Positive Youth Development. *Journal of Positive Psychology*, 6, 45–56. doi:10.1080/17439760.2010.536777
- Singh-Manoux, A., Adler, N. E., & Marmot, M. G. (2003). Subjective social status: Its determinants and its association with measures of ill-health in the Whitehall II study. *Social Science & Medicine*, 56, 1321–1333. doi:10.1016/S0277-9536(02)00131-4
- Thoits, P. A. (2010). Stress and health: Major findings and policy implications. *Journal of Health and Social Behavior*, 51(Suppl. 1), S41–S53.
- Turner, M. G., Hartman, J. L., Exum, M. L., & Cullen, F. T. (2007). Examining the cumulative effects of protective factors: Resiliency among a national sample of high-risk youths. *Journal of Offender Rehabilitation*, 46(1–2), 81–111. doi:10.1080/10509670802071535
- Turner, R. J., & Avison, W. R. (2003). Status variations in stress exposure: Implications for the interpretation of research on race, socioeconomic status, and gender. *Journal of Health and Social Behavior*, 44, 488–505.
- Vaillancourt, T., Brittain, H. L., McDougall, P., & Duku, E. (2013). Longitudinal links between childhood peer victimization, internalizing and externalizing programs, and academic functioning: Developmental cascades. *Journal of Abnormal Psychology*, 122, 1203–1215. doi:10.1007/s10802-013-9781-5
- Walsemann, K. M., Geronimus, A. T., & Gee, G. C. (2008). Accumulating disadvantage over the life course: Evidence from a longitudinal study investigating the relationship between educational advantage in youth and health in middle age. *Research on Aging*, 30, 169–199. doi:10.1177/0164027507311149
- Walton, G. M., & Cohen, G. L. (2007). A question of belonging: Race, social fit, and achievement. *Journal of Personality and Social Psychology*, 92, 82–96.
- Williams, D. R., & Mohammed, S. A. (2009). Discrimination and racial disparities in health: Evidence and needed research. *Journal of Behavioral Medicine*, 32, 20–47. doi:10.1007/s10865-008-9185-0
- Willingham, D. T. (2012, Spring). Why does family wealth affect learning? *American Educator*, pp. 33–39.
- Wong, C. A., Eccles, J. S., & Sameroff, A. (2003). The influence of ethnic discrimination and ethnic identification on African American adolescents' school and socioemotional adjustment. *Journal of Personality*, 71, 1197–1232. doi:10.1111/1467-6494.7106012

Dana M. Prince, PhD, MPH, is assistant professor, Mandel School of Applied Social Sciences, Case Western Reserve University, 11235 Bellflower Road, Cleveland, OH 44106; e-mail: dana.prince@case.edu. **Anita Rocha, MSW**, is a doctoral student and **Paula S. Nurius, PhD**, is professor, School of Social Work, University of Washington, Seattle.

Original manuscript received January 6, 2017
Final revision received March 27, 2017
Editorial decision March 27, 2017
Accepted March 27, 2017
Advance Access Publication July 27, 2018