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Life Course Associations Between Victimization and Aggression: Distinct and Cumulative Contributions

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Abstract The connections between early maltreatment and later aggression are well established in the literature, however gaps remain in our understanding of developmental processes. This study investigates the cascading life course linkages between victimization experiences from childhood through early adulthood and later aggressive behavior. The diverse, at-risk sample is of particular importance to child and adolescent specialists, as it represents highly vulnerable youth accessible through conventional school settings. In addition to direct pathways from proximal life periods, path analysis revealed significant indirect mediated pathways through which earlier life victimization contributes to aggressive behaviors in later life periods as well as revictimization. Multivariate regressions support theorized cumulative effects of multiform victimization as well as distinct contributions of victimization domains (emotional, witnessing, physical, property, and sexual) in explaining aggressive behavior. Consistent with theorizing about the developmental impact of early maltreatment, results bolster the importance of interrupting pathways from victimization to revictimization and later aggression. Findings are evaluated in light of implications for early identification and prevention programming.

Keywords Victimization · Abuse · Violence · Aggression · Development

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The prevalence of violence exposure experienced in childhood and adolescence is a significant social problem, as are its noted negative sequelae, which include depression, anxiety, and aggression (e.g., Brown et al. 2007; Thompson et al. 2002). Although numerous studies have examined the connection between victimization and later aggression (Jennings et al. 2012; Maas et al. 2008), gaps remain in our understanding that hamper intervention efforts. Few studies span early childhood through adulthood, making integration of findings with respect to victimization timing difficult (Horwitz et al. 2001). In addition, contradictory findings obscure understanding which types of violence exposures contribute most to aggression (e.g., Yun et al. 2011). The current study addresses these knowledge gaps by examining pathways from victimization to aggression across three lifespan periods, illuminating effects of developmental stages in the linkages between aggression and victimization. Complementing this developmental picture, we also test effects for domains of victimization that are salient to aggressive behavior within and across these periods.

Background and Literature Review

Recent longitudinal studies provide insights into life course patterns of aggressive behaviors (Huesmann et al. 2009; Odgers et al. 2008) as well as differential effects of timing of victimization experiences (MacMillan 2001). Although

some youths' experiences are limited to a single type of victimization occurring within a single developmental period (e.g., childhood), the more common experience is exposure to multiple forms of victimization and/or revictimization at a later age (Benjet et al. 2010; Finkelhor et al. 2007; Messman-Moore and Long 2000). However, few studies have traced the potential linkages between multiform victimization and aggression from childhood into adulthood. Examination of such linkages across life periods as well as distinct versus cumulative victimization effects is critical to understanding the processes by which violence affects development, and to identify opportunities for intervention for those at risk.

Although multiple theories link victimization and later aggressive behavior, we propose that "developmental cascades" may be triggered by early life exposure to victimization, which initiate a process whereby trauma-based ties between revictimization and later aggression are mutually reinforced (Fig. 1). Cascade effects are noted in a broad array of fields, and refer to processes in which changes in one part of a system resonate throughout the system over time, often via reciprocal processes (Ford and Lerner 1992; Sameroff 2000). Linking victimization and aggression through cascades parallels theorizing that situates childhood maltreatment within a developmental, transactional framework (Cicchetti and Toth 1995; Davis and Cicchetti 2004), which postulates that child development is a complex interplay of characteristics of the child and his or her environment, with negative and positive influences interacting over time with individual characteristics. The timing of victimization experiences is recognized to have differential effects depending on the child's cognitive and coping capacity (Cicchetti and Toth 1995). Early violence exposure, particularly if persistent or polyform, can catalyze developmental trauma-related disorders spawning dysregulations that underlie behavioral disorders such as aggression (van der Kolk 2005; van der Kolk and d'Andrea 2010).

Within this developmental framework, advances in understanding the persisting effects of childhood maltreatment have extended the prevailing social learning theories with increased understanding of the neurophysiological effects of trauma and adversity and how these

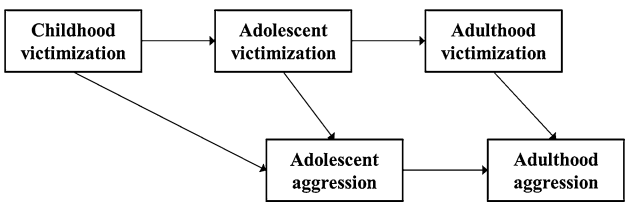

Fig. 1 Hypothesized model of lifetime victimization and aggression

interplay with development and coping. Social learning theory posits that modeled and normalized aggression shape violence in youth through psychosocial processes of observation and learning, which are reinforced and become habitual (Bandura 1977, Bandura et al. 1962). Recent extensions to this behavioral model incorporate neurobiological processes to explain how early stress may dysregulate brain and physiologic functions related to later aggressive behavior (Shonkoff and Garner 2012). From this perspective, exposure to early maltreatment results in neurobiological changes, such as dysregulated stress hormone responding, which underlies behaviors such as hypervigilance and emotion dysregulation. In turn such dysregulation may interfere with adaptive coping and predispose individuals to aggressive behavior (Lee and Hoaken 2007). These explanations are distinct yet may underlie behavioral changes and help make sense of the psychosocial developmental cascades that stem from early childhood experiences.

Evidence is accruing regarding stressful social contexts, operationalized using concepts such as stress proliferation, whereby the experience of significant stressors leads to further adverse conditions via self- and peer-selection processes (Turner 2010). These patterns form problematic situational cascades of opportunities for negative experiences that parallel the less readily discernible biobehavioral cascades (Pearlin et al. 2005). For instance, early life victimization often yields problematic emotional and behavioral responding that can erode external protective resources and expose individuals to negative contexts that increase risk for additional deleterious experiences and/or socially facilitated acts of aggression (Hill et al. 2010).

Domains of victimization experiences are thought to contribute in somewhat different ways to the development of aggressive impulses, attitudes, and behaviors. Physical maltreatment has been a prominent focal point (Jennings et al. 2012; Maas et al. 2008). However, findings suggest that other forms of victimization experiences are at least as, if not more, relevant to engaging in aggression (Fang and Corso 2007; Yun et al. 2011). Recent work examining an array of victimization experiences demonstrated that multiple domains, such as physical, emotional, sexual, and witnessed violence, as well as exposure to criminal behaviors such as property victimization, confer enduring trauma symptoms (Finkelhor et al. 2007). Moreover, evidence that cumulative effects of multi-form victimization may exceed those of any one form (Duke et al. 2010; Turner 2010) argues for a broad assessment of victimization experiences in studying the developmental etiology of aggression.

Studies linking victimization and aggression have been based primarily on community samples of typical youth (e.g., national surveys such as the National Longitudinal

Study of Adolescent Health) or adjudicated samples, such as those involved in the juvenile court system. These provide universal (youth in general) as well as clinical (youth already system-involved) insights, leaving, however, gaps regarding youth who are at elevated risk but still engaged in normative community settings. The current study addresses this knowledge gap, focusing on youth still reachable for targeted prevention programming in school settings, but teetering on the edge of failure within that context. These youth are representative of the population that may be most amenable to targeted interventions within school settings. In the era of limited funding for broad-spectrum interventions with youth, prioritizing preventive efforts with youth who may benefit most is critical.

Study Research Questions

The current study contributes to theory development spanning childhood, adolescence, and adulthood, allowing assessment of time-proximal as well as sustained contributions from more time-distal victimizations. An additional benefit is the inclusion of multiple domains of violence exposure, allowing for discrimination of distinct effects of different victimization forms as well as cumulative, multiform effects. The first of our two central research questions focuses on specifying pathways between cumulative victimization exposure from childhood to adulthood and later aggression. In addition to contemporaneous pathways, are sustained effects of victimization from earlier life periods evident? The second question addresses the potentially distinct contribution of different forms of victimization, while simultaneously generating a characterization of cumulative victimization. In other words, accounting for the overlapping effects of other domains of victimization, do some forms have unique contributions in predicting aggressive behavior?

Methods

Sample

Study participants were originally recruited from high schools in two urban areas in the western United States. In the initial adolescent assessment, youth were randomly chosen from an eligible pool based on established criteria for risk of school dropout (Herting 1990): either two of the following (1) below credits for grade level, (2) top 25th percentile in school absences, (3) GPA of 2.3 or less and/or a pattern of slipping grades: or (4) prior school dropout status: or (5) standardized school referral as at-risk of school failure plus meeting at least one of criteria 1–3 above. Use of risk of school dropout/failure operationalized by these criteria results in youth samples with a constellation of risk factors/behaviors, consistent with others' conceptualizations of vulnerable youth (Jones et al. 2011; Miles and Stipek 2006), which we anticipated would include violence exposure and aggression.

The current follow-up study was based on a recontact sample drawn from a sampling pool of 298 individuals who completed all assessments from the original longitudinal study (see Hooven et al. 2012 for details). Funding for the follow-up study was limited to 125 participants, and participants were reached via archived contact information and earlier stated openness to further participation. Interviews were conducted via telephone by experienced, trained research staff, following Institutional Review Board procedures with informed consent. Responses were recorded electronically by the interviewer and exported to SPSS for cleaning and quality checks. Two of the 125 surveys were unusable and therefore dropped—one for excessive missing data, and the other for questionable responses. With one exception, comparisons between the 298 participants in the sample pool and the 123 participants drawn for this follow-up study showed no differences on any demographic or study variables, including the general levels of victimization reported at adolescence. The exception was that there were fewer African Americans in this sample (13 %) compared to the sample pool (17 %). The study sample was reasonably sex-balanced (66 males, 57 females) and ethnically/racially diverse: 46 % identified themselves as Caucasian, 21 % as Latino/Hispanic, 13 % African American, 8 % Asian American, 5 % Native American, and 7 % mixed race.

Measures

Victimization was based on an adapted version of the Juvenile Victimization Questionnaire-Revised (JVQ-R). This widely-used instrument has demonstrated satisfactory psychometric properties in a variety of samples (Finkelhor et al. 2005a, b), including retrospective assessment in adulthood of earlier life victimization (Richmond et al. 2009). Five domains are assessed: *emotional maltreatment* (3 items—by peer, adult, partner/ex-partner), *witnessing* (3 items—family and community violence), *physical maltreatment* (6 items—by peer, adult, partner/ex-partner, with and without weapons), *property assault* (1 item—theft or intentional destruction), and *sexual victimization* (4 items—by peer, stranger adult, known adult, partner/ex-partner). Detailed item descriptions are available through the Crimes against Children website (http://www.unh.edu/ccrc/jvq/available_versions.html). The reduced-item version of the survey was modified to include three items assessing emotional, physical, and sexual maltreatment by a romantic partner during adolescence or adulthood and to

ascertain the number of times each assessed form of victimization occurred. Respondents were first asked whether they had ever experienced each form of victimization and, if so, reported the frequency of occurrences distinguished by developmental periods: during *childhood* (up to high school, age 14), in *adolescence* (high school entrance to graduation or equivalent time point), and in *adulthood*. For each period, recall was aided by instructing participants to think about where they were living, attending school, and related characteristics of the time (Belli et al. 2009).

To create scales, *domain frequencies* were calculated by summing frequencies of occurrences for each item within each of the five domains for each period (e.g., childhood emotional maltreatment, adolescent witnessing). Second, *composite period scores* (e.g., childhood victimization) were created by averaging the sums of the five domains within each developmental stage. In the following analyses, all measures of victimization were log-transformed to address skew.

The *aggression* measure included items related to physical fighting, physically or emotionally injuring a romantic partner, physically injuring someone other than a partner, and deliberately damaging others' property. Using the same methodology as used in the victimization assessment, participants were asked to identify the frequency of occurrence for each item within adolescence and within adulthood. Frequencies were summed within each period and log-transformed. These items were selected because they were part of the original prospective survey in which adolescents were asked to what extent they engaged in these behaviors (rather than number of occurrences); the timeframe was not specified in the original assessment. Although differences in these measures limit direct comparison of responses, previous comparison of patterns of responding indicated strong correspondence (Nurius et al. 2010).

Analysis Plan

To address the first research question, we performed a path analysis (using Mplus 6.0) to model the life course relationships of cumulative victimization, re-victimization, and aggression from childhood to adulthood (Fig. 2). We used robust standard errors to correct for non-normal distributions. We considered multiple fit statistics in determining model fit (Kline 2010). The analyses controlled for the effects of race/ethnicity and sex on all endogenous variables.

To address the second research question, we correlated study variables to examine bivariate relationships among adolescent and adult aggression and the domains of victimization by each developmental period (Table 2). Then, we assessed for potential differences in victimization

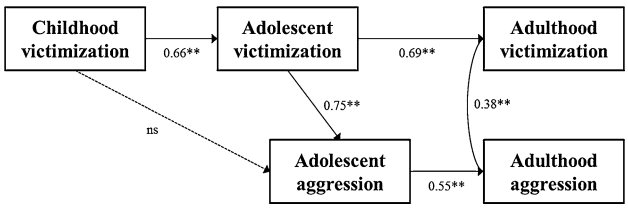

Fig. 2 Path analysis of lifetime victimization and aggression. $^{**}p \leq 0.01$. R^2 values: adolescent victimization = 0.44, adulthood victimization = 0.47, adolescent aggression = 0.56, adulthood aggression = 0.30 (all significant at $p < 0.01$). Model controls for effects of sex and race/ethnicity

histories as a function of sex and race/ethnicity. Although males generally reported higher levels of victimization, significance was evident only for property assault (childhood $t(121) = 3.54$, $p \leq .001$, adolescence $t(121) = 2.49$, $p = .025$, adulthood $t(121) = 2.40$, $p = .025$), and witnessed violence in adulthood ($t(121) = 2.84$, $p = .005$) with males also reporting higher levels in aggressive behavior (adolescence $t(121) = 3.04$, $p \leq .005$; adulthood $t(121) = 3.26$, $p \leq .001$).Accordingly, sex was included as a control variable. Although race/ethnicity was not significant in preliminary t tests, to be consistent with published work we controlled for both sex and race/ethnicity in the multivariate linear regression to address the second research question regarding the cumulative and distinct contributions of the five victimization domains in accounting for aggression.

Results

Path Analysis

The initial model (Fig. 1) had unsatisfactory fit results. The modification indices revealed that a correlation between adulthood victimization and aggression fit the data better than a unidirectional pathway. The final model (Fig. 2) was based on this single change. Model fit characteristics were consonant with the hypothesized pathways, and all fit indices were acceptable to good (Kline 2010): $\chi^2(5) = 14.22$, $p = 0.014$, Comparative Fit Index = 0.96, Tucker-Lewis Index = .92, and standardized root mean square residual = 0.047. Pathways shown in Fig. 2 are significant at $p \leq 0.01$, with the exception of the dashed pathway from childhood victimization to adolescent aggression. R^2 values were .44 for adolescent victimization, .47 for adulthood victimization, .56 for adolescent aggression, and .30 for adulthood aggression (all p values ≤ 0.01).

All indirect effects were statistically significant (see Table 1). Specifically, childhood victimization carried significant indirect effects to adolescent and adulthood

Table 1 Indirect effects in path analysis

Pathway	Estimate	Standard error	*p*
Childhood victimization to adulthood victimization	0.45	0.09	<0.001
Adolescent victimization to adulthood aggression	0.41	0.07	<0.001
Childhood victimization to adulthood aggression	0.27	0.06	<0.001
Childhood victimization to adolescent aggression	0.49	0.07	<0.001

aggression as well as to adulthood victimization through the hypothesized intervening variables; adolescent victimization contributed significantly to adult aggression via adolescent aggression.

Bivariate Associations of Victimization Domains with Aggression

Table 2 demonstrates largely significant patterns of correlation between the five victimization domains and aggression both within and across lifespan periods. Particularly large coefficients were observed for witnessing, physical, and property victimization.

Multivariate Regressions

Regressions analyses were run separately to test childhood and adolescent victimization predictors (see Table 3); both achieved significance. Unlike the bivariate correlations in Table 2, the beta coefficients reflect the unique contribution of each victimization domain to aggression, controlling for effects of sex, race/ethnicity, and the other victimization domains. Sex was a significant predictor in all models, reflecting higher levels of aggression by males; race/ethnicity was non-significant. The proximal effects of victimization in adolescence contributed more substantially to adolescent aggression relative to the effects of childhood victimization. However, childhood witnessing and physical maltreatment were direct and significant predictors. The variance explained for adolescent aggression was relatively high, especially for adolescent victimization experiences (66 %).

Similarly, all regressions predicting adulthood aggression achieved statistical significance. Physical abuse and property victimization during both childhood and adolescence remained significant and distinct contributors to adult aggression, after accounting for sex, race/ethnicity, and other victimization forms. Physical victimization in adulthood was also a unique contributor to adulthood aggression, joined by emotional victimization and witnessed violence. The explained variance for adulthood aggression ranged from 22 to 39 %.

Discussion

This study provides a more nuanced test than has typically been available regarding the contribution of life course victimization to explain adolescent and adulthood aggression. Path analysis demonstrated the predictive value of victimization at each period assessed simultaneously, illuminating indirect effects through repeated victimization and through earlier life perpetration in addition to direct pathway effects. Correlation and regression results demonstrated both the aggregate and distinct contributions of five domains of victimization experiences occurring in childhood, in adolescence, and in adulthood relative to adolescent and adulthood aggression. The relatively strong relationships between victimization and aggression across time highlight the need for interventions to address the effects of victimization across the lifespan and to reduce the occurrence of revictimization.

Modeling Lifespan Pathways

The path analysis documents the powerful lifespan connections between victimization, revictimization, and aggression, including indirect pathways through which earlier life exposures cascade through histories of

Table 2 Correlations between adolescent and adult aggression with victimization by domain and lifespan period

Victimization form	Adolescent aggression		Adulthood aggression		
	Childhood victimization	Adolescent victimization	Childhood victimization	Adolescent victimization	Adulthood victimization
Emotional	.28**	.39**	.22*	.21*	.39**
Witnessing	.42**	.62**	.26**	.30**	.50**
Physical	.41**	.70**	.39**	.39**	.52**
Property	.40**	.52**	.32**	.34**	.24**
Sexual	.06	.34**	.10	.27**	.22*

† $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$

Table 3 Multiple regression results using victimization domains from childhood, adolescence and adulthood to predict adolescent and adulthood aggression

Victimization form	Adolescent aggression		Adulthood aggression		
	Childhood victimization	Adolescent victimization	Childhood victimization	Adolescent victimization	Adulthood victimization
Emotional	0.03 (0.03)	0.01 (0.01)	−0.04 (−0.02)	0.01 (0.01)	0.21 (.015)*
Witnessing	0.25 (0.21)*	0.24 (0.22)**	0.02 (0.02)	0.03 (0.03)	0.24 (0.24)**
Physical	0.17 (0.14)†	0.41 (0.47)**	0.31 (0.21)**	0.21 (0.20)†	0.28 (0.33)**
Property	0.15 (0.20)	0.29 (0.42)**	0.17 (0.19)	0.21 (0.26)*	−0.03 (−0.04)
Sexual	−0.08 (−0.14)	0.11 (0.27)†	−0.01 (−0.01)	0.18 (0.38)†	0.02 (0.03)
Sex	−0.18 (−0.38)*	−0.16 (−0.34)**	−0.17 (−0.30)†	−0.23 (−0.41)**	−0.17 (−0.31)*
Race	0.04 (0.09)	0.05 (0.11)	0.03 (0.05)	0.03 (0.06)	0.01 (0.02)
F	6.65**	31.56**	4.56**	6.26**	10.44**
R^2	0.29**	0.66**	0.22**	0.28**	0.39**

Standardized (beta) coefficients (unstandardized coefficients). Sex coding: male = 1, female = 2. Race coding: Caucasian = 0, all other races/ethnicities = 1

† $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$

victimization and offending. Contemporaneous victimization and perpetration were strongly associated in adolescence and adulthood. The mutually reinforcing interplay between violence exposure and violence engagement is evinced in these analysis. Although the analyses did not test the direction of such contemporaneous effects, these have been observed in other studies and merit more frequent attention than they often receive (Begle et al. 2011).

This model also suggests that victimization and aggression have differing interactions in adolescence versus adulthood. It is well established that the majority of youth who are aggressive or violent in adolescence will desist by adulthood (cf. Moffitt 1993), and that there are substantial differences between those who continue their antisocial careers into adulthood and those who do not (Moffitt and Caspi 2001; Odgers et al. 2008). In this model, the contribution of victimization was stronger for adolescent than adult aggression, suggesting that other factors not contained in this study, such as personality characteristics or internalized social norms, are more important in adulthood. This study does not provide basis to speculate on desistance, however other studies suggest that positive work and romantic relationships are important (e.g., Whitaker et al. 2010). In contrast, over half of the variance of adolescent aggression was accounted for by the single pathway from adolescent victimization, including the indirect effects of childhood experiences. This finding is consonant with prior studies that have also suggested that childhood victimization is primarily predictive of later aggression through the mediating pathway of revictimization (Stewart et al. 2008; Thornberry et al. 2001). This important finding argues strongly for the need to prevent further victimization experiences for children identified as having been exposed to violence.

Expectations for the sustained effects of early victimization were also supported—with significant direct paths to later victimization and indirect paths to later aggression. The variance explained for downstream variables was also robust, underscoring the importance of the "cycle of violence" linkages (Widom 1989). These associations are consistent with growing evidence of stress proliferation and developmental victimology, wherein early stress impacts such as violence exposure are associated with increased risk of later exposure and the disruption of adaptive coping capacity (Pearlin et al. 2005; Shonkoff et al. 2009; Turner et al. 2006a, b). The notion of a trauma-induced offense cycle (Greenwald 2002), describes the effect of early victimization, and particularly repeat victimization in producing cognitive and affective patterns, such as hypervigilance to danger, emotional dysregulation, a sense of hopelessness, and biased interpretation of social cues as hostile, evoking defense. These patterns hamper developmental acquisition of problem-solving and appropriate coping skills, heighten risk of triggering trauma-related emotions, and fuel use of aggressive social behaviors, which contributes to the cycle of violent responding and revictimization, thereby reinforcing these cascades (Hosser et al. 2007). Moreover, evidence indicates that early life exposures, particularly involving multiple victimization forms, are linked to changes in stress-responsive neurobiological and endocrine systems (Lee and Hoaken 2007). Such changes often go unrecognized but transmit effects erosive of adaptive development and coping and carry forward to adult aggression as well as physical and mental health outcomes (Anda et al. 2006; Schilling et al. 2007).

Distinguishing Unique Victimization Effects Across Periods

Comparison of the bivariate correlations and standardized regression coefficients illustrates the value of multi-form assessment of violence exposure. Bivariate associations demonstrate that all of the specific victimizations measured are associated with later aggression, reinforcing the importance of intervening for youth who have experienced any kind of violence exposure. The muting of some specific types in the regression models supports our contention that the impact of victimization is largely the result of the cumulative effects of multiple forms of victimization across the early lifespan. Research that focuses on singular forms of violence risks misrepresentation of the distinct, contextualized role of that form, and is unable to account for cumulative effects across domains either cross-sectionally or longitudinally (Davidson et al. 2010; Turner et al. 2006b).

Important patterns emerge in the multivariate analysis when compared to the bivariate results. For example, emotional maltreatment in each period is significantly associated with aggression. In the multivariate regressions, when the variance it shares with other domains is controlled, the distinct contribution reflected in the beta for emotional maltreatment is muted. Thus, while emotional maltreatment contributes to the overall explanation of violence, only in adulthood does it demonstrate unique contribution to aggression net of other forms of violence exposure. This relationship may reflect respondent aggression in the context of high-conflict romantic partnerships in adulthood, as demonstrated by the higher levels of partner violence reported in adulthood (Renner and Whitney 2012).In contrast, linkages of youth emotional maltreatment to aggression in some studies may primarily reflect overlapping experiences of other forms of maltreatment. For both age groups, these results still underscore the need to view emotional maltreatment seriously, either as indicative of other concurrent possible exposures, or as a precursor to possible escalation towards physical aggression.

Witnessing violence was significantly correlated with both adolescent and adult aggression in all periods. When accounting for other violence exposure domains, earlier life witnessing did not contribute to adult aggression directly, but adult witnessing did significantly increase adult aggression. Interestingly, item-level analysis demonstrated that the strongest component in this domain in adulthood was witnessing someone else being attacked, not family violence. This shifting pattern of violence from predominantly within to outside the home may reflect the expected developmental continuum that moves from a focus on family events to broader social contexts where risk conditions expand, including selection into peer contexts where violence may be more frequent (Danielson et al. 2006; McCabe et al. 2005). As individuals encounter later life forms of violence, they may bring to these encounters neurophysiological remnants of prior experiences such as cortisol dysregulation (Rogosch et al. 2011) in addition to psychosocial learning histories. Such dysregulations are increasingly recognized as part of stress embodiment processes that overly tax coping capacity and foster deterioration of physical, psychological, and behavioral health. Given the prominence of victimization as well as other adverse conditions in developmental histories of violence perpetration, future research would benefit from neurophysiological assessment of the linkages between victimization and aggression (Roberts et al. 2011).

Consistent with prior evidence, physical maltreatment was the strongest single regression predictor of engaging in violence in most periods (Maas et al. 2008). Theories of social learning—habituation to and incorporation of aggression and underlying attitudes—provide explanation for repeated exposure to physical abuse as a crucial predictor of aggression. Yet, the experience of physical maltreatment typically occurs within contexts of multiple forms of exposure. Our finding that rarely was physical maltreatment the sole unique predictor of aggression indicates that toxic effects stemming from multi-form victimization extend to aggression. It is thus particularly important for practitioners to recognize early signs of physical aggression among youth who have experienced physical abuse, and to provide or recommend appropriate treatments to prevent aggressive tendencies from evolving into violence.

Property assault, which is rarely assessed, was uniquely contributive to both adolescent and adulthood violence, particularly victimization in adolescence. We speculate that this variable captures extra-familial experiences, such as theft or destruction of property within neighborhood or school-based contexts. From a developmental perspective, neighborhood effects in youth may convey a unique formative impact, additive to familial adversity sources, which, in turn, contribute to the development of violence normalization and behavioral choices that mediate connections from early victimization to later aggression (Matjasko et al. 2010). This finding specifies the overlooked value of more fully assessing community-level violence exposures in conjunction with the more frequently assessed family and partner sources (Gorman-Smith et al. 2004).

Although sexual victimization in adolescence and adulthood were significantly correlated with aggression, only adolescent victimization was uniquely contributive to later aggression in the multivariate models. This may be attributable in part to the higher levels of sexual victimization

during adolescence relative to other periods, and the inclusion of peers and dating partners in addition to victimization by adults (Casey and Nurius 2006). Sexual victimization, however, typically occurs in the context of other violence exposures and carries unique effects on later mental health, such as substance use and depression, suggesting stronger relationships to internalizing rather than externalizing difficulties (Benjet et al. 2010; Hooven et al. 2012).

Limitations

The at-risk characteristics of the study sample represent both a strength and a potential limitation. Originally recruited in adolescence on the basis of risk of drop-out from typical school settings, these individuals, now in adulthood, help fill a knowledge gap due to research based on samples drawn from general community or from juvenile treatment or correctional settings. Though circumscribing generalizability, the findings are particularly informative for school and community-based prevention efforts targeting vulnerable youth. A second potential limiting factor is the retrospective nature of the victimization and aggression reports. Biasing factors tend toward underreporting. However, retrospective reporting methods used here appear to have little to no impact on linear trends as reported in related research on retrospective reporting of similar events (Hardt et al. 2010; Smith et al. 2008). Assessment of measurement reliability undertaken in the current study demonstrated both acceptability (no refusals or reports of inordinate distress in participation) and satisfactory reliability compared to prior assessment. Finally, though the small sample size limits analytic options and the use of multiple control variables, the path analysis is clearly within the analytic range, and provides a strong foundation for broader scale research that will examine the influence of additional risk and protective factors.

Conclusions and Implications

These findings reinforce the importance of assessing violence exposure at multiple points in development, the earlier the better. Childhood victimization not only negatively affects healthy development, but sets the stage for revictimization and for later aggression, in what may become patterns sustaining well into adulthood. A recent review (Carnochan et al. 2013) delineates the most promising avenues to prevent revictimization. These methods include implementing best practices by Child Protective Service agencies, such as valid risk assessment, structured decision making, and differential response, which seeks to respond to families in a collaborative, non-punitive matter to better facilitate familial resilience (Conley 2007). Universal or indicated prevention programs such as the incredible years (Webster-Stratton and Reid 2004) also have promise in terms of fostering resilience among children and families. Youth with early signs of behavioral problems may respond to familial interventions designed to prevent revictimization, such as Triple P-Positive Parenting Program (Sanders 1999). Research has demonstrated that most victims of multiple maltreatments have elevated individual, family, or community risk factors (Finkelhor et al. 2009); these domains can serve as both indicators of risk and potentially mutable targets of interventions. Conversely, some intervention programs for vulnerable families and children may leverage protective factors, such as positive school environments or caring adults, to ameliorate the effects of early victimization and prevent future exposures (Child Welfare Information Gateway 2014).

In addition to these structured approaches, there is a need to train front-line practitioners, including pediatricians, school counselors and nurses, and teachers, to recognize the signs both the signs of abuse and at-risk families (Flaerty et al. 2010; Gilbert et al. 2009). Research suggests that the majority of maltreatment cases go undetected, missing the opportunity to intervene and interrupt the developmental impact of repeated victimization. Training practitioners who have frequent contact with young children to recognize abuse is the best means to provide for early identification and prevent later aggression or other mental health problems that may result (Gilbert et al. 2009). As public schools have the most frequent face-to-face contact with young children, particularly impoverished or disconnected families that may not access other services, it is imperative that school personnel in particular be trained to recognize and effectively report suspected cases of maltreatment (Koller 2006).

Detection of violence exposure—whether direct maltreatment, indirect forms such as witnessing, or criminal victimization such as property assault—provides a basis for targeting and preventing future victimization as well as the development of aggressive responding. While violence perpetration often elicits punitive community responses, these findings contribute to altering perspectives through heightened attention to victimization and related adversity-exposure effects among aggressive youth (Hosser et al. 2007). Accumulated findings such as these support recent moves to make juvenile justice systems more trauma-informed (SAMHSA 2012). Previously maltreated juveniles who are showing signs of aggression may be referred to interventions that attend to prior traumas, such as trauma-informed cognitive behavioral therapy (Griffin et al. 2012). Again, studies such as this show that it is important to intervene earlier, to interrupt cascades established in youth, and to prevent more aggression and

victimization in adulthood, when access and responsivity to treatment may be more difficult.

Moreover, the victimization-aggression link is associated with other high risk behaviors such as drug use, alcohol use, and school misbehavior or suspension, and suicide risk (Begle et al. 2011; Logan-Greene et al. 2012; Swahn et al. 2008). The results thus underscore the importance of interventions to reduce risk behaviors associated with victimization and to bolster protective factors. For those who have experienced victimization, research points to malleable factors that may mediate or moderate the links to aggression, including social support and positive family connections (Hill et al. 2010; Logan-Greene et al. 2011).

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