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Change in externalizing problems over time among ethnic minority youth exposed to violence

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ABSTRACT

Youth exposed to violence, many of whom are from racial/ethnic minority backgrounds, are at high risk for externalizing problems such as aggressive and oppositional behavior, conduct problems, and delinquency. Most interventions target youth with already high levels of such problems, while selective prevention efforts have received less attention. It is important for researchers, policy makers and practitioners to understand how such problems develop and change over time, and how selective prevention may impact externalizing problems. In this study, we examined one-year trajectories of externalizing problems in 883 low-income, ethnic minority youth exposed to violence who participated in randomized controlled trials testing a prevention program for high-risk youth called the Strengthening Families Program. We found three trajectories of externalizing problems: Low Externalizing (43% of the sample had consistently low levels of externalizing symptoms), Persisters (39% of the sample had consistently high levels of externalizing symptoms), and Improvers (18% of the sample had initially high levels of externalizing symptoms that decreased over time). There were demographic differences between the three trajectories with individuals in the Low Externalizing trajectory more likely to be female and younger than those in the other two trajectories and Persisters and Improvers had significantly more problems with baseline internalizing symptoms, family conflict, and parenting behavior compared to the Low Externalizing trajectory. Logistic regressions then tested several predictors of membership in the Persisters trajectory compared to the Improvers trajectory, controlling for all covariates simultaneously. Only baseline parenting behavior and intervention group membership significantly predicted trajectory membership, and these were small and unreliable effects. Thus, children with varying levels of violence exposure, co-occurring emotional/behavioral problems and family issues, and varying demographics (e.g., age and gender) may do equally well over time, but engagement in this type of intervention may increase the likelihood that high levels of externalizing problems are ameliorated over time.

1. Introduction

Children and youth's exposure to violence such as child maltreatment, witnessing domestic violence, and community and school violence, is relatively common. Recent data from a nationally representative sample indicated that 58% of children had been exposed to violence in the past year, and 48% had been exposed to multiple types of violence (Finkelhor, Shattuck, Turner, & Hamby, 2014; Finkelhor, Turner, Shattuck, & Hamby, 2015). Low income and racial and ethnic minority youth are at particularly high risk for violence exposure. For example, one large national survey found that as income increased, prevalence of youth witnessing violence or being physically or sexually abused/assaulted significantly decreased (Crouch, Hanson, Saunders, Kilpatrick, & Resnick, 2000). Differences were also observed by race and ethnicity, where Black and Hispanic youth were more likely to have been exposed to violence compared to their White non-Hispanic peers (Crouch et al., 2000).

Empirical research has established that children and adolescents exposed to violence are at high risk for developing a range of emotional and behavioral problems, including externalizing problems (e.g., aggression, conduct problems, oppositional and risky behavior) (Foster & Brooks-Gunn, 2009; Vu, Jouriles, McDonald, & Rosenfield, 2016). For instance, through a meta-analysis of 1870 studies on family violence, Sternberg, Baradaran, Abbott, Lamb, and Guterman (2006) estimated that 29–43% (depending on gender and type of violence exposure) of 10–14 year olds exposed to violence had clinically significant externalizing problems, compared to 16% of those not exposed to violence (Sternberg et al., 2006). The association between youth

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violence exposure and externalizing problems has been extensively studied, and implicated mechanisms of risk include biological and social learning processes (Caspi et al., 2002; Dodge, Bates, & Pettit, 1990; Widom, 1989).

There is strong evidence that interventions for youth externalizing problems—particularly those focused on changing parental behaviors and family processes with cognitive behavioral techniques—can substantially reduce problematic externalizing behaviors (Hambree-Kigin & McNeil, 2013; Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 2009; McMahon & Forehand, 2005; Sanders, 1999). Some of these treatments have also demonstrated efficacy in samples of youth exposed to specific forms of violence (Timmer, Ware, Urquiza, & Zebell, 2010). However, the vast majority of interventions for externalizing problems were designed for youth with clinically significant levels of symptoms. There is much less extant research on selective prevention programs that aim to reduce or prevent symptoms from developing following violence exposure. Further, tests of interventions for externalizing problems within violence-exposed youth populations have typically selected youth exposed to a specific form of violence (e.g., physical abuse or witnessing domestic violence). However, as stated above, research has shown that youth are commonly exposed to more than one type of violence (Finkelhor, Ormrod, Turner, & Hamby, 2005), limiting the generalizability of such findings. Thus, there is a need to examine the efficacy and effectiveness of selective prevention programs for youth exposed to a range of different forms of violence exposure.

To address this important gap, the United States Department of Justice's Office of Juvenile Justice and Delinquency Prevention sponsored the Safe Start Promising Approaches (SSPA) initiative. Through SSPA, community based organizations and behavioral health agencies implemented and tested a range of evidence-informed programs for diverse populations of violence-exposed youth across the country. These selective prevention programs were designed to identify children exposed to violence and reduce or prevent symptoms from developing subsequent to the violence exposure. Among the programs tested was the Strengthening Families Program (SFP) (Kumpfer, Alvarado, Tait, & Turner, 2002; Kumpfer & DeMarsh, 1985), which is a 14-week prevention program designed for families of children at high risk for substance use and delinquency. SFP uses social learning and family systems theories to teach parenting skills related to child discipline and communication to encourage positive child behaviors. Children and youth also attend separate workshops focused on life skills during the first hour of the session, and then join their parent(s) for the second hour for a joint session incorporating skill-building exercises that allow families to apply the skills they learned in the first hour. SFP is disseminated as a "model program" by the Center for Substance Abuse Prevention (CSAP), which is part of the Substance Abuse and Mental Health Services Administration (SAMHSA). There is quasi-experimental evidence that SFP can impact parenting skills, family relationships and behavioral self-regulation, among other outcomes related to externalizing behaviors (Kumpfer et al., 2002; Kumpfer & DeMarsh, 1985). However, a randomized controlled trial (RCT) of SFP in urban African American families found that the intervention did not help to reduce externalizing problems in participating youth (Gottfredson et al., 2006). The authors noted that difficulty recruiting and retaining participants may have contributed to their null findings. In light of this mixed evidence for SFP even as it is widely disseminated with federal support, it is important to conduct rigorous tests in diverse high-risk communities to determine whether it can help to reduce youth externalizing problems.

Two of the ten sites funded through the SSPA initiative conducted RCTs testing SFP in primarily Black and Hispanic families exposed to a range of violence types. These sites achieved relatively high retention rates in the intervention and in the study, addressing one of the limitations of previous research. Results of intent to treat analyses showed that externalizing symptoms in both the intervention and comparison groups improved significantly from baseline to six and twelve-month follow-ups but there were no significant group differences [BLINDED]. In other words, externalizing problems in the intervention group did not decrease significantly more than they did in the comparison condition. One explanation for these null findings is the possibility that—since the target populations for SFP were not selected based on symptom levels—the baseline levels of externalizing problem behaviors were not high enough to demonstrate detectably different rates of change between groups. It is also possible that factors other than intervention group are more powerful predictors of the rate of change in externalizing problems over time. However, the analysis of average treatment effects used in most RCTs can obscure the differential impact that treatments can have on subgroups of individuals (Chaney, 2016; Gabler et al., 2016). For example, a treatment may work well for certain racial/ethnic groups but not others.

In the current study, we conducted secondary analyses of the SSPA data to further explore the rates of change in externalizing problems in the full sample of youth who participated at the two sites testing SFP. Our primary goal was to determine whether – given both intervention and comparison groups improved throughout the study—we could identify subgroups of youth whose externalizing symptoms improved faster or slower than others (i.e., trajectories of externalizing behavior problems), and to test baseline ("prognostic") indicators of these trajectories, including intervention group. For example, some youth may exhibit a high level of externalizing problems following violence exposure but a decline in symptoms over time, whereas others' symptoms remain high over the same period. Similarly, some youth may display a delayed onset of externalizing problems where symptoms worsen over time following violence exposure, and others may never display externalizing problems. Participation in SFP may be associated with change in externalizing problems within some subgroups but not others. However, there are also other factors, beyond intervention group, that may predict differential rates of change in externalizing problems.

To select potential prognostic indicators of externalizing trajectories beyond intervention group, we looked to the empirical literature for factors with established associations with externalizing problems in youth. We found that some of the most consistent predictors of externalizing problems included demographic characteristics such as age, gender, race/ethnicity and family income, polyvictimization, parenting, family conflict, and other psychopathology such as internalizing problems (Beyers, Bates, Pettit, & Dodge, 2003; Dearing, McCartney, & Taylor, 2006; Ford, Elhai, Connor, & Frueh, 2010; Koblinsky, Kuvalanka, & Randolph, 2006; Lindahl & Malik, 1999; Miner & Clarke-Stewart, 2008; Reitz, Dekovic, & Meijer, 2006; Snyder, Cramer, Afrank, & Patterson, 2005). For example, low-income, racial/ethnic minority and male youth are more likely to be rated by caregivers and teachers as having externalizing problems compared to higher-income, White and female youth (Dearing et al., 2006; Miner & Clarke-Stewart, 2008). Youth who experience multiple types of victimization (i.e., polyvictimization) are at high risk for externalizing problems even after accounting for other types of psychopathology (Ford et al., 2010). Further, youth whose parents utilize ineffective discipline strategies, provide less parental monitoring, and lower levels of positive involvement display higher levels of externalizing behavior (Beyers et al., 2003; Snyder et al., 2005), as do those living in families with high levels of conflict (Koblinsky et al., 2006; Lindahl & Malik, 1999). Finally, there is strong evidence that internalizing problems (e.g., depression and anxiety) and externalizing problems (e.g., aggression/oppositional behavior, conduct problems, delinquency) frequently co-occur in youth, and that youth with internalizing symptoms are at elevated risk for developing externalizing problems (Beyers & Loeber, 2003; Verhulst & van der Ende, 1993).

In this study we examined the course of externalizing problems over one year for a sample of 883 primarily low-income, racial/ethnic minority youth exposed to violence who participated in an RCT testing

SFP. We sought to understand (1) whether externalizing problems changed at different rates over time for subgroups of youth, and (2) whether we could identify easy-to-measure prognostic indicators of these trajectories, such as intervention group, demographic characteristics (age, gender, race/ethnicity, family income), number of types of violence exposure, parenting behavior, family conflict, and internalizing problems.

2. Method

2.1. Design and procedures

In the present study, we examined one-year trajectories of externalizing problems (i.e., from baseline to 12 month follow up) and their prognostic indicators, pooling data from two sites that participated in the Safe Start Promising Approaches (SSPA) initiative, funded by the Office of Juvenile Justice and Delinquency Prevention. This initiative sought to implement and evaluate interventions for children exposed to violence in community settings (http://www.ojjdp.gov/programs/safestart/ImprovingOutcomesforChildrenExposedtoViolence.pdf). Ten sites were involved in the evaluation, but the current study focuses on the samples from Detroit, MI and El Paso, TX, the two sites that tested SFP. For more information about the full Safe Start evaluation methods and findings see [BLINDED].

At each site, a randomized controlled trial examined the impact of adaptations of the Strengthening Families Program (SFP; (Gottfredson et al., 2006; Kumpfer et al., 2002)), a 14-week family based group therapy intervention, for youth exposed to violence. The Detroit site focused on families with children ages 3 to 16 and recruited about half of the families from its existing client population with the remainder through referrals from local schools. Detroit offered an enhanced version of SFP that included 2 sessions of Psychological First Aid and intensive case management so the overall intervention was delivered in closed groups over a 16-week period. The El Paso site served families with children ages 3 to 14 referred from a range of agencies and organizations including the judicial system, law enforcement, child protective services, schools, and other community-based organizations. El Paso offered a culturally adapted version of SFP delivered in Spanish in weekly sessions over 14 weeks. Program staff also provided monthly, phone-based or in-person case management after the 14-week program.

Both studies were reviewed by the [BLINDED IRB], and informed consent was obtained from all participants. Caregivers and youth completed assessments at baseline and at 6- and 12-month follow up. Families were randomly assigned to the intervention or comparison condition at baseline. Intervention group families received the SFP intervention plus case management and comparison group families received case management. Comparison group families in Detroit were also offered a seven-week health/nutrition group.

For the current study, the sample sizes at baseline were 403 for Detroit (201 intervention, 202 comparison) and 486 for El Paso (238 intervention, 242 comparison) for a total sample of 883 (439 intervention, 444 comparison). For Detroit, children in the baseline sample were on average 8.5 years old (range 3–17), with a majority being female (58%), Hispanic (61%), and having family incomes less than $30,000 (89%). In El Paso, children in the sample were on average 8.4 years old (range 3–15), with a majority being male (57%), Hispanic (99%), and reporting family incomes less than $30,000 (92%).

Retention at the follow-up assessments was good. Eighty-five percent of the sample was retained at 6 months (N = 753; n = 373 intervention, n = 380 comparison) and 84% of the sample was retained at 12 months (N = 745; n = 378 intervention, n = 367 comparison). As explored and reported elsewhere, there were no significant intervention effects observed at the $p < 0.05$ level for any outcome at either site using intent-to-treat analyses [BLINDED].

2.2. Measures

2.2.1. Demographics

Caregiver report of child age, gender, race/ethnicity, and family income were collected using items adapted from the LONGSCAN study (LONGSCAN, 2010). Because ethnicity and site were highly confounded in this sample (i.e., El Paso's sample was 99% Hispanic, whereas Detroit's was 61% Hispanic), we created a 3-level categorical variable combining ethnicity and site such that 1 = Detroit/Hispanic, 2 = El Paso/Hispanic, and 3 = Detroit/non-Hispanic (dropping a handful [n = 6] of non-Hispanic participants in El Paso who were not significantly different from Hispanic youth in age, gender or baseline externalizing) that enabled us to tease apart any potential differences by site or race/ethnicity.

2.2.2. Baseline violence exposure

To assess recent exposure to violence among children ages birth to 12, the study used 19 items from the Juvenile Victimization Questionnaire (JVQ; (Hamby, Finkelhor, Ormrod, & Turner, 2004)). The caregiver-report version was completed by caregivers of children between the ages of 3 and 11, and the self-report version was completed by children between the ages of 10 and 16. For youth with both a caregiver and self-report (i.e., those ages 10–11 with completed assessments at the time point) we used the score from the youth self-report. Both the youth and caregiver report versions of the JVQ have shown good reliability and validity (Finkelhor et al., 2005). For these analyses, we computed a total score for the entire measure, with higher scores indicating more types of violence exposure ($\alpha = 0.64$ in the current sample). Some caution against interpreting internal consistency indicators for life events measures like the JVQ because while the items belong in one conceptual category, there is no reason to believe they are necessarily correlated (Turner & Wheaton, 1997). Types of violence exposure assessed by the JVQ include witnessing violence, maltreatment, physical and sexual assault, and neglect.

2.2.3. Parenting behavior

At baseline, the study examined parenting practices using caregivers' reports of their own parenting behavior on the 42-item Alabama Parenting Questionnaire (APQ; (Frick, 1991)). The APQ has demonstrated strong reliability and validity (Dadds, Maujean, & Fraser, 2003; Frick, Christian, & Wootton, 1999). For these analyses, we used the negative/ineffective discipline (e.g., “you threaten to punish your child and then do not actually punish him/her”; 11 items; $\alpha = 0.62$), deficient monitoring (e.g., “your child goes out without a set time to be home”; 8 items; $\alpha = 0.79$), and positive involvement (e.g., “you let your child know when s/he is doing a good job with something”; 16 items; $\alpha = 0.86$) subscales. Cronbach's alphas for this sample are consistent with previous studies where alphas range from 0.25 to 0.82 depending on the subscale and sample (Frick et al., 1999; Shelton, Frick, & Wootton, 1996). Items were rated on a 5-point scale where 1 = never and 5 = always.

2.2.4. Family conflict

Caregiver report on the family conflict subscale (9 items; $\alpha = 0.61$) from the Family Environment Scale (FES; (Moos, Insel, & Humphrey, 1974)) was used as a measure of family conflict at baseline. The FES has good psychometric properties (Moos, 1990). Caregivers responded to statements about their perceptions of the family environment (e.g., “family members sometimes get so angry they throw things” and “family members often criticize each other”) by indicating True or False to each statement with the total score a sum of the number of True responses.

2.2.5. Internalizing problems

Internalizing problems were measured at baseline using the internalizing problems subscale (11 items) of the Behavior Problems Index

(BPI; (Peterson & Zill, 1986)). The BPI has demonstrated good psychometric properties (Kahn, Brandt, & Whitaker, 2004). The BPI internalizing problems subscale has good internal consistency in the current sample (α = 0.84). Items were rated on a 3-point scale where 0 = not true, 1 = sometimes true, and 2 = often true. The internalizing total score was a sum of the number of items endorsed as sometimes or often true, with total scores thus ranging from 0 to 11.

2.2.6. Externalizing problems

Externalizing problems were measured at baseline, 6 months and 12 months using the externalizing problems subscale (17 items) of the Behavior Problems Index (BPI; (Peterson & Zill, 1986)). The BPI externalizing problems subscale has good internal consistency (α = 0.91). Items were rated on a 3-point scale where 0 = not true, 1 = sometimes true, and 2 = often true. The externalizing total score was a sum of the number of items endorsed as sometimes or often true, with total scores thus ranging from 0 to 17.

2.3. Analyses

Descriptive statistics (means, standard deviations, frequencies) were first conducted using SAS (version 9.4, SAS Institute Inc., Cary, NC) to examine demographics and violence exposure in the baseline sample. We then examined means and standard deviations of externalizing problems at each time point.

To explore trajectories of externalizing problems, we conducted growth mixture modeling (GMM; (McArdle, 2005; Nagin, 1999)) analysis to identify the latent trajectory classes based on the externalizing problem outcome obtained at the three time points (baseline, 6 months and 12 months). GMM is an extension of longitudinal growth models that uses structural equation modeling techniques to model trajectories of change in outcome, assess effects of treatment and other covariates if necessary, and consider the relationships among multiple time points simultaneously. This method explores latent, unobserved grouping of participants that share similar pattern of change in outcome. For decades, statistical tools such as GMM have been successfully applied to longitudinal datasets to describe the number and shape of violence, aggression and delinquency trajectories (Jennings & Reingle, 2012; Piquero, Farrington, & Blumstein, 2007).

GMM models were estimated in Mplus version 7.2 (Muthen & Muthen, 1998–2012) using linear models with no covariate adjustment, extracting a varying number of classes, from 2 to 5. All models (with between 2 and 5 classes) converged on a replicated solution and could confidently be assumed to obtain the best maximum likelihood. The strategy for selecting the optimal number of classes is still controversial (Nylund, Asparoutiov, & Muthen, 2007; Tofighi & Enders, 2008) but in this study, we used the fit indices from models with a varying number of classes that have been shown to be adequate discriminators of classes in simulation studies (Nylund et al., 2007). Comparative fit was evaluated with the Bayesian Information Criterion (BIC), the Lo-Mendell-Rubin likelihood ratio test (LRT) and the Vuong-Lo-Mendell-Rubin likelihood ratio test, (VLRT) (Lo, Mendell, & Rubin, 2001). Preferred models minimize BIC and are those for which both likelihood ratio tests show significantly better fit compared to the model with one less class.

After assignment of each participant to their most likely class membership, bivariate analyses (chi square tests, ANOVAs) followed by logistic regressions in SAS were used to test potential prognostic indicators of the different externalizing trajectories, including intervention group. The bivariate analysis used a chi-square (for categorical indicators) and an F-test (for continuous indicators) to test for any difference between the externalizing classes without controlling for additional covariates. The logistic regression model repeated the comparisons controlling for all the covariates to account for confounding.

Table 1
Baseline sample characteristics.

Variable	Category	N	%, mean (SD)
Site/ethnicity	Detroit Hispanic	245	27.75
	El Paso Hispanic	480	54.36
	Detroit non-Hispanic	158	17.89
Site	Detroit	403	45.64
	El Paso	480	54.36
Child race/ethnicity	Hispanic	725	82.11
	White	3	0.34
	Black	144	16.31
	Other	11	1.25
Intervention group	Intervention	439	49.72
	Comparison	444	50.28
Income	< $10,000	384	44.09
	$10–20,000	285	32.72
	$20–30,000	123	14.12
	> $30,000	79	9.07
Child age	Mean	883	8.41 (3.46)
Child gender	Female	440	49.83
	Male	443	50.17
Baseline child violence exposure	Mean	871	1.45 (1.80)
Baseline internalizing problems	Mean	883	4.3 (3.11)
Baseline family conflict	Mean	882	3.2 (2.02)
Baseline negative/ineffective discipline	Mean	636	22.47 (5.75)
Baseline deficient monitoring	Mean	636	9.92 (3.75)
Baseline positive involvement	Mean	632	64.71 (9.21)

Note. SD = standard deviation.

3. Results

3.1. Descriptives

Baseline characteristics of the sample are shown in Table 1. The mean externalizing problems score was 8.59 (SD = 4.74) at baseline, 6.95 (SD = 4.82) at 6 months, and 6.55 (SD = 4.73) at 12 months.

3.2. Externalizing trajectories

Table 2 provides the fit indices for the one- through five-class solutions that resulted from GMM. As shown, BIC continued to decrease as the number of class increased, up until 4 and 5 classes when the BIC increased. The LRT values indicated that the three-class solution was the best fitting model, as the three-class model fit significantly better than the two class solution, but the four and five class solution VLMR and LMR were non-significant. Based on these indices, a three-class solution was seen as optimal.

As shown in Fig. 1, 345 (39.1%) youth belonged to a group whose trajectory of externalizing problems started high and remained high throughout the study (for context, recall that externalizing scores can range from 0 to 17). We called this group “Persisters.” Another 379 (42.9%) of the sample started out with low levels of externalizing problems, which remained low throughout the study. We called this group “Low Externalizing.” The third trajectory, which we refer to as

Table 2
Fit indices for one- through five-class GMM solutions.

# of classes	BIC	VLMR	LMR
1	13,366.35	NA	NA
2	13,321.37	0.00	0.00
3	13,260.75	0.001	0.002
4	13,277.66	0.24	0.26
5	13,301.45	0.97	0.97

Note. GMM = growth mixture modeling; BIC = Bayesian information criteria; VLMR = Vuong, Lo, Mendell, Rubin likelihood ratio test; LMR = Lo, Mendell, Rubin adjusted likelihood ratio test; NA = not applicable.

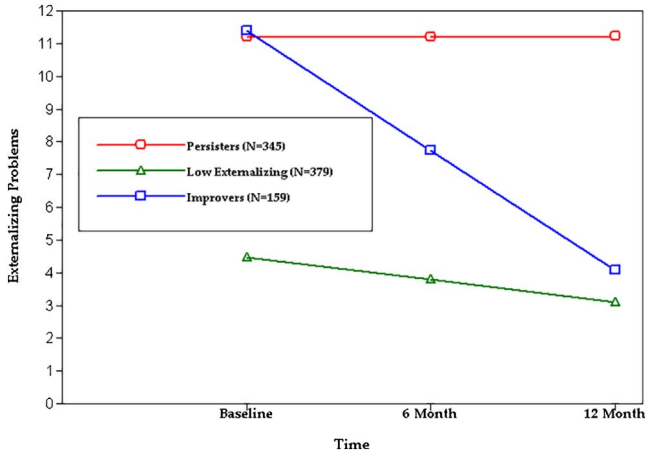

Fig. 1. GMM three-class solution: Model estimated mean trajectories.

"Improvers," represents a group of youth (n = 159, 18.0% of the sample) who started out with high levels of externalizing problems that steadily decreased over time.

3.3. Characteristics of externalizing trajectories

We first compared individuals in the three identified trajectories in terms of their intervention group, site/ethnicity (Detroit Hispanics, Detroit non-Hispanics, or El Paso Hispanics), family income, child age, gender, and baseline violence exposure, internalizing problems, family conflict, and the three parenting behavior subscales (see Table 3). For this analysis, each factor was examined separately in bivariate regressions. Several significant differences between individuals in the three trajectories emerged. There were significant differences by site/ethnicity with nearly half of El Paso Hispanics and Detroit non-Hispanics in the Persisters group and only approximately one quarter of Detroit Hispanics in the Persisters group. While the majority of Detroit Hispanics (69.80%) were in the Low Externalizing group, only 43% of the non-Hispanics in Detroit and 29% of the El Paso Hispanics were in that group. Also, 25% of Hispanics in El Paso were Improvers while 14% of non-Hispanics and 7% of Hispanics in Detroit were Improvers. Persisters' mean age was the highest among the trajectories (Mean age = 8.78 years), with Low Externalizing youth significantly younger (Mean age = 7.91 years). Gender differed significantly across the groups. Almost half of the female youth in the sample were in the Low Externalizing group compared to 39% of males whereas around 16% of females were Improvers compared to 20% of males. Persisters and Improvers were exposed to nearly 2 types of violence on average, significantly more than the approximately one type of violence exposure for the Low Externalizing group. This same pattern was found with internalizing, family conflict and parenting, where the Persisters and Improvers had significantly higher levels of internalizing problems (Persisters mean = 5.64, Improvers mean = 6.08, Low Externalizing mean = 2.33), family conflict (Persisters mean = 3.72, Improvers mean = 3.94, Low Externalizing mean = 2.42), and the negative parenting behaviors of negative/ineffective discipline (Persisters mean = 23.83, Improvers mean = 24.53, Low Externalizing mean = 20.21) and deficient monitoring (Persisters mean = 10.89, Improvers mean = 10.09, Low Externalizing mean = 8.93) but significantly lower positive involvement (Persisters mean = 62.19, Improvers mean = 64.23, Low Externalizing mean = 67.33) compared to the Low Externalizing trajectory. There were no significant differences in intervention group or family income.

In sum, the Low Externalizing trajectory is characterized by individuals who not only have lower levels of externalizing problems at baseline, but also differ from the other two trajectories in many other ways (lower levels of violence exposure, internalizing problems, family conflict, negative parenting behaviors and higher positive involvement). The individuals in this trajectory were also more likely to be female and younger than those in the other two trajectories. In contrast, the Persisters and Improvers are more similar to one another, and yet one group shows improvement over time and the other does not. Thus, we focused on the contrast between Improvers and Persisters in the logistic regression analyses that follow in order to understand the indicators of who might be expected to improve and who might have persistent externalizing problems, controlling for other factors.

3.4. Prognostic indicators of externalizing trajectories

Next, we conducted logistic regressions testing intervention group, baseline demographics, violence exposure, internalizing problems,

Table 3
Characteristics of externalizing trajectories.

Variable	Category	N total	Persisters %[a], mean (SD)	Low Externalizing %[a], mean (SD)	Improvers %[a], mean (SD)	Bivariate results
Site/ethnicity	Detroit Hispanic	245	23.67	69.80	6.53	$\chi^2(4) = 116.37^{***}$
	El Paso Hispanic	480	45.63	29.17	25.21	
	Detroit non-Hispanic	158	43.04	43.04	13.92	
Intervention group	Intervention	439	37.36	41.91	20.73	$\chi^2(2) = 4.46$
	Comparison	444	40.77	43.92	15.32	
Income	< $10,000	384	41.67	39.32	19.01	$\chi^2(6) = 4.60$
	$10–20,000	285	39.65	42.81	17.54	
	$20–30,000	123	35.77	48.78	15.45	
	> $30,000	79	34.18	45.57	20.25	
Child age	Mean	883	8.78 (3.63)	7.91 (3.38)	8.76 (3.11)	$F(2882) = 6.84^{**}$
Child gender	Female	440	37.05	47.05	15.91	$\chi^2(2) = 6.54^{*}$
	Male	443	41.08	38.83	20.09	
Baseline child violence exposure	Mean	871	1.87 (1.96)	0.88 (1.40)	1.87 (1.91)	$F(2870) = 35.31^{***}$
Baseline internalizing problems	Mean	883	5.65 (2.81)	2.33 (2.21)	6.08 (2.97)	$F(2882) = 192.92^{***}$
Baseline family conflict	Mean	882	3.72 (1.98)	2.42 (1.77)	3.94 (2.03)	$F(2881) = 57.07^{***}$
Baseline negative/ineffective discipline	Mean	636	23.83 (5.74)	20.21 (5.08)	24.53 (5.48)	$F(2635) = 39.6^{***}$
Baseline deficient monitoring	Mean	636	10.89 (4.73)	8.93 (2.27)	10.09 (3.55)	$F(2535) = 18.61^{***}$
Baseline positive involvement	Mean	632	62.19 (9.44)	67.33 (8.48)	64.23 (8.80)	$F(2631) = 21.28^{***}$

Note. [a]Row percentages; SD = standard deviation.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 4
Logistic regression results of potential prognostic indicators predicting persisters externalizing trajectory (reference group = improvers).

Predictor	b (SE)	OR	95% CI
Site/ethnicity = El Paso/Hispanic (ref = Detroit/Hispanic)	− 0.61 (0.36)	0.56	0.28–1.14
Site/ethnicity = Detroit/non-Hispanic (ref = Detroit/Hispanic)	0.11 (0.44)	1.11	0.47–2.65
Intervention group	− 0.49 (0.23)	0.61*	0.39–0.96
Family income	0.01 (0.06)	1.01	0.89–1.14
Child age	0.05 (0.05)	1.05	0.95–1.15
Gender = male (ref = female)	− 0.15 (0.24)	0.90	0.56–1.42
Baseline violence exposure	− 0.02 (0.06)	0.98	0.87–1.11
Baseline internalizing problems	− 0.02 (0.04)	0.99	0.91–1.07
Baseline family conflict	− 0.03 (0.06)	0.97	0.86–1.10
Baseline negative/ineffective discipline	− 0.04 (0.02)	0.96*	0.92–1.00
Baseline deficient monitoring	0.02 (0.03)	1.02	0.96–1.09
Baseline positive involvement	− 0.03 (0.01)	0.97*	0.94–1.00

Note. OR = odds ratio; CI = confidence interval; ref = reference group.
* $p < 0.05$.

family conflict and parenting behavior together as predictors or "prognostic indicators" of change in, or trajectories of, externalizing problems. For these regressions, we compared Persisters and Improvers with the Improvers group as the reference category. Three variables significantly distinguished individuals in the Persisters and Improvers trajectories: intervention group, negative/ineffective discipline, and positive involvement. Odds ratios and 95% confidence intervals associated with membership in the Persisters, relative to the Improvers trajectory, are shown in Table 4 along with the significance level of each comparison. The odds ratios can be interpreted as the odds that the categorical predictor (e.g., male gender) or higher levels of the continuous predictor (e.g., older child age) was associated with membership in the Persisters trajectory relative to the Improvers trajectory. Specifically:

- Odds ratios < 1 where the 95% confidence interval does not overlap with 1 suggest the categorical predictor group or higher levels of the continuous predictor are less likely to be a Persister than an Improver.
- Odds ratios > 1 where the 95% confidence interval does not overlap with 1 suggest the categorical predictor group or higher levels of the continuous predictor are more likely to be a Persister than an Improver.
- Odds ratios of 1 suggest no relationship between the predictor variable and membership in the two trajectories and are none significant and thus not interpreted.

After controlling for all covariates in one model, there were three statistically significant prognostic indicators. First, youth in the intervention groups in these two sites were 39% less likely to be in the Persisters group relative to the Improvers group. Second, youth whose caregivers reported high levels of positive involvement were slightly less likely (3%) to belong to the Persisters trajectory, compared to the Improvers trajectory. Third, youth whose caregivers reported high levels of negative/ineffective discipline were also slightly less likely (4%) to be Persisters rather than Improvers. It is important to note, however, that although statistically significant, the odds ratios for positive involvement and negative/ineffective discipline were very close to 1.00 with confidence interval upper bounds at 1.00, suggesting relatively small effects.

4. Discussion

This study provides new information on patterns of change in child externalizing problems among low-income ethnic minority youth receiving community-based services related to violence exposure, including some who participated in the Strengthening Families Program (SFP), a prevention program for high-risk youth and their families.

We found three different trajectories of change in externalizing problems over the year following entry into the study. One group had few externalizing symptoms to begin with, compared to the other two groups (the "Low Externalizing" group). These children had been exposed to fewer types of violence in the prior six months and were also demonstrating fewer internalizing problems and lower levels of family conflict and negative parenting behaviors. The children in this group were also younger and more likely to be girls. Hispanics in Detroit and El Paso were quite different in terms of group membership with 70% of Detroit Hispanics in the "Low Externalizing" group compared to 29% of El Paso Hispanics. This suggests that most Detroit Hispanics started with low symptoms while El Paso Hispanics began the study with higher level symptoms. The "Low Externalizing" group maintained relatively stable, low levels of externalizing throughout the study. Longer-term follow-up would be necessary to see whether their externalizing problems remain low, or if there are any predictors of this group's trajectory over time. The other two groups were more similar to one another at baseline, and started out with higher externalizing symptoms. But interestingly, one group improved over the course of the year (the "Improvers") and the other showed persistent externalizing problems (the "Persisters"). Hispanics in El Paso appear to have fared worse with more of them in the "Persisters" group compared to Hispanics in Detroit (46% vs. 24%). Again, this may be due to baseline levels of externalizing starting at different points for Hispanics at each site.

We compared the Improvers to the Persisters on several factors shown to be related to externalizing problems in prior studies, to understand why some improved and some did not. The only robust predictor of group membership was intervention group status. Children in the intervention group were more likely to be in the Improver group, indicating that participation in SFP was helpful for the group of children who started out with relatively high externalizing symptoms. This finding stands in contrast to the main evaluation study examining changes in outcomes using an intent-to-treat and differences-in-differences approach, which did not find a significant intervention effect on externalizing problems or other outcomes within the Detroit or El Paso studies [BLINDED]. Yet when data from the two sites were pooled, with the Low Externalizing group omitted, we observed that those who participated in SFP were more likely to be in the group that demonstrated improvement, in comparison to the group that stayed the same. This may be in part explained by the Low Externalizing group, which could not improve much due to a floor effect, watering down the results in the main study. In other words, it is unlikely that statistically significant decreases in externalizing would be observed within youth who already begin the study with very low symptoms. Without separating this group from the rest of the sample, it is difficult to detect significant change in symptoms among other youth who started with elevated symptoms (e.g., the Persisters).

While intervention group participants were more likely to be improvers than comparison group participants, there were still almost twice as many youth who showed persistent externalizing symptoms than improved symptoms in the intervention group, and a similar pattern was observed among comparison youth. This suggests that persistent externalizing symptoms affect a substantial proportion of youth and that many fewer show remitting symptoms, even when they have received an intervention. Thus, more research is needed to unearth factors that may explain these different trajectories and to identify intervention strategies to better address more persistent symptoms.

Two aspects of parenting behavior at baseline, positive involvement

and negative/ineffective discipline, were statistically significantly related to trajectories of improvement of externalizing symptoms over the year post-enrollment. However, these effects were quite small, with odds ratios very with upper bounds at 1.00, and in opposite directions, indicating that these findings may not be reliable and should be replicated. In addition, while similar to previous studies, Cronbach's alpha for the negative/ineffective discipline scale was below 0.70, which is the value of alpha thought to indicate acceptable internal consistency. Thus, findings from this subscale should be interpreted cautiously. If positive involvement does predict membership in the Improvers trajectory is consistent with extant literature that positive parenting behavior can protect youth against the development of externalizing problems (Beyers et al., 2003; Snyder et al., 2005) but the possible finding that those reporting more negative/ineffective discipline are also more likely to be in the Improvers group - even after controlling for potential confounders - is counter-intuitive. This area of inquiry requires more research to understand whether and how parenting practices might influence trajectories of externalizing problems over time for families engaged in community services.

Other factors did not predict membership in the Persisters compared to Improvers trajectory. Notably, baseline violence exposure, severity of internalizing problems, and family conflict did not predict externalizing trajectory, nor did deficient parental monitoring. Child age, family income, and child gender similarly did not predict whether youth would be a member of the Persisters or Improvers trajectory. This means that upon entry into a program for children exposed to violence, practitioners can expect children with varying levels of violence exposure, co-occurring behavioral problems and family issues, and varying demographics to do equally well over time.

This study has a number of limitations that are important to note, to put the findings in context. First, the current analyses were conducted in a subsample of youth selected from a larger evaluation study of programs for youth exposed to violence. All youth in the current sample received some community-based services (either the Strengthening Families Program or case management/nutrition services) and therefore our findings may not be generalizable to violence-exposed youth who do not have access to such services. Overall, most youth also started out with relatively low levels of externalizing problems, suggesting our findings may not be generalizable to those with externalizing symptoms in the clinical range at baseline. The finding that membership in the intervention group distinguished between Persisters and Improvers indicates that receipt of such services indeed matters, and thus we may have found somewhat different trajectories in a different type of sample. Furthermore, we examined a finite set of potential prognostic indicators. It is possible that other, unmeasured variables are important predictors of externalizing trajectories in this population. Unmeasured variables could also have influenced our findings. For instance, we do not have information about the frequency or severity of violence experience by participants between study time points, or about receipt of external mental health services, all of which could have affected externalizing trajectories.

Despite these limitations, the current study makes a strong contribution to a relatively sparse literature on the course of externalizing problems following violence exposure. The study's longitudinal design, relatively large sample size, one-year time interval, and focus on low-income, ethnic minority youth are strengths - particularly in the context of the extant literature, which has focused on longer-term externalizing trajectories in lower-risk populations. Overall, our results suggest that among high-risk violence exposed youth who start out with high levels of externalizing problems and other risk factors, engagement in selective prevention programs including community-based family services like the Strengthening Families Program may be helpful. In addition, initial levels of positive and negative parenting should be further explored as potential prognostic indicators of externalizing trajectories in future studies.

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Conflicts of interest

None.

References

Beyers, J. M., Bates, J. E., Pettit, G. S., & Dodge, K. A. (2003). Neighborhood structure, parenting processes, and the development of youths' externalizing behaviors: A multilevel analysis. *American Journal of Community Psychology, 31*(1–2), 35–53. http://dx.doi.org/10.1023/A:1023018502759.

Beyers, J. M., & Loeber, R. (2003). Untangling developmental relations between depressed mood and delinquency in male adolescents. *Journal of Abnormal Child Psychology, 31*(3), 247–266. http://dx.doi.org/10.1023/A:1023225428957.

Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., ... Poulton, R. (2002). Role of genotype in the cycle of violence in maltreated children. *Science, 297*(5582), 851–854. http://dx.doi.org/10.1126/science.1072290.

Chaney, B. (2016). Reconsidering findings of “no effects” in randomized control trials. *American Journal of Evaluation, 37*(1), 45–62.

Crouch, J. L., Hanson, R. F., Saunders, B. E., Kilpatrick, D. G., & Resnick, H. S. (2000). Income, race/ethnicity and exposure to violence in youth: Results from the national survey of adolescents. *Journal of Community Psychology, 28*(6), 625–641. http://dx.doi.org/10.1002/1520-6629(200011)28:6<625::Aid-Jcop6>3.0.Co;2-R.

Dadds, M. R., Maujean, A., & Fraser, J. A. (2003). Parenting and conduct problems in children: Australian data and psychometric properties of the Alabama Parenting Questionnaire. *Australian Psychologist, 38*(3), 238–241. http://dx.doi.org/10.1080/00050060310001707267.

Dearing, E., McCartney, K., & Taylor, B. A. (2006). Within-child associations between family income and externalizing and internalizing problems. *Developmental Psychology, 42*(2), 237–252. http://dx.doi.org/10.1037/0012-1649.42.2.237.

Dodge, K. A., Bates, J. E., & Pettit, G. S. (1990). Mechanisms in the cycle of violence. *Science, 250*(4988), 1678–1683.

Finkelhor, D., Ormrod, R., Turner, H., & Hamby, S. L. (2005). The victimization of children and youth: A comprehensive, national survey. *Child Maltreatment, 10*(1), 5–25. http://dx.doi.org/10.1177/1077559504271287.

Finkelhor, D., Shattuck, A., Turner, H. A., & Hamby, S. L. (2014). Trends in children's exposure to violence, 2003 to 2011. *JAMA Pediatrics, 168*(6), 540–546. http://dx.doi.org/10.1001/jamapediatrics.2013.5296.

Finkelhor, D., Turner, H. A., Shattuck, A., & Hamby, S. L. (2015). Prevalence of childhood exposure to violence, crime, and abuse: Results from the national survey of children's exposure to violence. *JAMA Pediatrics, 169*(8), 746–754. http://dx.doi.org/10.1001/jamapediatrics.2015.0676.

Ford, J. D., Elhai, J. D., Connor, D. F., & Frueh, B. C. (2010). Poly-victimization and risk of posttraumatic, depressive, and substance use disorders and involvement in delinquency in a national sample of adolescents. *Journal of Adolescent Health, 46*(6), 545–552. http://dx.doi.org/10.1016/j.jadohealth.2009.11.212.

Foster, H., & Brooks-Gunn, J. (2009). Toward a stress process model of children's exposure to physical family and community violence. *Clinical Child and Family Psychology Review, 12*(2), 71–94. http://dx.doi.org/10.1007/s10567-009-0049-0.

Frick, P. J. (1991). *The Alabama parenting questionnaire.* University of Alabama.

Frick, P. J., Christian, R. E., & Wootton, J. M. (1999). Age trends in the association between parenting practices and conduct problems. *Behavior Modification, 23*(1), 106–128. http://dx.doi.org/10.1177/0145445599231005.

Gabler, N. B., Duan, N. H., Raneses, E., Suttner, L., Ciarametaro, M., Cooney, E., ... Kravitz, R. L. (2016). No improvement in the reporting of clinical trial subgroup effects in high-impact general medical journals. *Trials, 17*. http://dx.doi.org/10.1186/S13063-016-1447-5 (doi: Artn 320).

Gottfredson, D., Kumpfer, K. L., Polizzi-Fox, D., Wilson, D., Puryear, V., Beatty, P., & Vilmenay, M. (2006). The Strengthening Washington DC Families project: A randomized effectiveness trial of family-based prevention. *Prevention Science, 7*(1), 57–74. http://dx.doi.org/10.1007/s11121-005-0017-y.

Hambree-Kigin, T. L., & McNeil, C. (2013). *Parent-child interaction therapy.* Springer Science & Business Media.

Hamby, S. L., Finkelhor, D., Ormrod, R., & Turner, H. (2004). *The Juvenile Victimization Questionnaire (JVQ): Administration and scoring manual.* Durham, NH: Crimes Against Children Research Center.

Henggeler, S. W., Schoenwald, S. K., Borduin, C. M., Rowland, M. D., & Cunningham, P. B. (2009). *Multisystemic therapy for antisocial behavior in children and adolescents.* Guilford Press.

Jennings, W. G., & Reingle, J. M. (2012). On the number and shape of developmental/life-course violence, aggression, and delinquency trajectories: A state-of-the-art review. *Journal of Criminal Justice, 40*(6), 472–489. http://dx.doi.org/10.1016/j.jcrimjus.2012.07.001.

Kahn, R. S., Brandt, D., & Whitaker, R. C. (2004). Combined effect of mothers' and fathers' mental health symptoms on children's behavioral and emotional well-being. *Archives of Pediatrics & Adolescent Medicine, 158*(8), 721–729. http://dx.doi.org/10.1001/Archpedi.158.8.721.

Koblinsky, S. A., Kuvalanka, K. A., & Randolph, S. M. (2006). Social skills and behavior problems of urban, African American preschoolers: Role of parenting practices, family conflict, and maternal depression. *American Journal of Orthopsychiatry, 76*(4), 554–563. http://dx.doi.org/10.1037/0002-9432.76.4.554.

Kumpfer, K. L., Alvarado, R., Tait, C., & Turner, C. (2002). Effectiveness of school-based family and children's skills training for substance abuse prevention among 6–8-year-old rural children. *Psychology of Addictive Behaviors, 16*(4), S65–S71. http://dx.doi.org/10.1037//0893-164X.16.4S.S65.

Kumpfer, K. L., & DeMarsh, J. P. (1985). Prevention of chemical dependency in children of alcohol and drug abusers. *NIDA Notes, 5*, 2–3.

Lindahl, K. M., & Malik, N. M. (1999). Marital conflict, family processes, and boys' externalizing behavior in Hispanic American and European American families. *Journal of Clinical Child Psychology, 28*(1), 12–24. http://dx.doi.org/10.1207/S15374424jccp2801_2.

Lo, Y. T., Mendell, N. R., & Rubin, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika, 88*(3), 767–778. http://dx.doi.org/10.1093/Biomet/88.3.767.

LONGSCAN (2010). LONGSCAN measures: Pre-age 4 through age 18 (updated 02/01/10). http://www.unc.edu/depts/sph/longscan/pages/measelect/Measure Table (up through Age 18 Interviews).pdf.

McArdle, J. J. (2005). Latent growth curve analysis using structural equation modeling techniques. In D. M. Teti (Ed.). *The handbook of research methods in developmental psychology* (pp. 340–466). New York: Blackwell Publishers.

McMahon, R. J., & Forehand, R. L. (2005). *Helping the noncompliant child: Family-based treatment for oppositional behavior.* Guilford Press.

Miner, J. L., & Clarke-Stewart, K. A. (2008). Trajectories of externalizing behavior from age 2 to age 9: Relations with gender, temperament, ethnicity, parenting, and rater. *Developmental Psychology, 44*(3), 771–786. http://dx.doi.org/10.1037/0012-1649.44.3.771.

Moos, R. H. (1990). Conceptual and empirical approaches to developing family-based assessment procedures - resolving the case of the family environment scale. *Family Process, 29*(2), 199–208. http://dx.doi.org/10.1111/J.1545-5300.1990.00199.X.

Moos, R. H., Insel, P. M., & Humphrey, B. (1974). *Preliminary manual for family environment scale, work environment scale, group environment scale.* Consulting Psychologists Press.

Muthen, L. K., & Muthen, B. O. (1998–2012). *Mplus User's Guide* (Seventh ed). Los Angeles, CA: Muthen & Muthen.

Nagin, D. S. (1999). Analyzing developmental trajectories: A semiparametric, group-based approach. *Psychological Methods, 4*(2), 139–157. http://dx.doi.org/10.1037/1082-989x.4.2.139.

Nylund, K. L., Asparoutiov, T., & Muthen, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling-a Multidisciplinary Journal, 14*(4), 535–569.

Peterson, J. L., & Zill, N. (1986). Marital disruption, parent-child relationships, and behavior problems in children. *Journal of Marriage and the Family, 48*(2), 295–307. http://dx.doi.org/10.2307/352397.

Piquero, A. R., Farrington, D. P., & Blumstein, A. (2007). *Key issues in criminal career research.* Cambridge: Cambridge University Press.

Reitz, E., Dekovic, M., & Meijer, A. M. (2006). Relations between parenting and externalizing and internalizing problem behaviour in early adolescence: Child behaviour as moderator and predictor. *Journal of Adolescence, 29*(3), 419–436. http://dx.doi.org/10.1016/j.adolescence.2005.08.003.

Sanders, M. R. (1999). Triple P-Positive Parenting Program: Towards an empirically validated multilevel parenting and family support strategy for the prevention of behavior and emotional problems in children. *Clinical Child and Family Psychology Review, 2*(2), 71–90.

Shelton, K. K., Frick, P. J., & Wootton, J. (1996). Assessment of parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology, 25*(3), 317–329. http://dx.doi.org/10.1207/S15374424jccp2503_8.

Snyder, J., Cramer, A., Afrank, J., & Patterson, G. R. (2005). The contributions of ineffective discipline and parental hostile attributions of child misbehavior to the development of conduct problems at home and school. *Developmental Psychology, 41*(1), 30–41. http://dx.doi.org/10.1037/0012-1649.41.1.30.

Sternberg, K. J., Baradaran, L. P., Abbott, C. B., Lamb, M. E., & Guterman, E. (2006). Type of violence, age, and gender differences in the effects of family violence on children's behavior problems: A mega-analysis. *Developmental Review, 26*(1), 89–112. http://dx.doi.org/10.1016/j.dr.2005.12.001.

Timmer, S. G., Ware, L. M., Urquiza, A. J., & Zebell, N. M. (2010). The effectiveness of parent-child interaction therapy for victims of interparental violence. *Violence and Victims, 25*(4), 486–503.

Tofighi, D., & Enders, C. K. (2008). Identifying the correct number of classes in growth mixture models. *Advances in Latent Variable Mixture Models,* 317–341.

Turner, R. J., & Wheaton, B. (1997). Checklist measures of stressful life events. In L. Gordon, S. Cohen, & R. Kessler (Eds.). *Measuring stress: A guide for health and social scientists.* Oxford, England: Oxford University Press.

Verhulst, F. C., & van der Ende, J. (1993). Comorbidity in an epidemiologic sample - a longitudinal perspective. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 34*(5), 767–783. http://dx.doi.org/10.1111/J.1469-7610.1993.Tb01070.X.

Vu, N. L., Jouriles, E. N., McDonald, R., & Rosenfield, D. (2016). Children's exposure to intimate partner violence: A meta-analysis of longitudinal associations with child adjustment problems. *Clinical Psychology Review, 46*, 25–33. http://dx.doi.org/10.1016/j.cpr.2016.04.003.

Widom, C. S. (1989). The cycle of violence. *Science, 244*(4901), 160–166.