Published in final edited form as:

J Adolesc Health. 2016 April ; 58(4): 433–439. doi:10.1016/j.jadohealth.2015.11.007.

Not Just Academics: Paths of Longitudinal Effects from Parent Involvement to Substance Abuse in Emerging Adulthood

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Abstract

Purpose—By the twelfth grade, half of American adolescents have abused an illicit drug at least once (Johnston et al., 2015). While many substance misuse prevention programs exist, we propose an alternative mechanism for reducing substance use. There is evidence that parent involvement is related to reductions in children's behavior problems which then predict later substance abuse. We examine the Child-Parent Center program (CPC), an early childhood intervention, as a strategy to impact substance abuse.

Methods—We conducted a path analysis from CPC to parent involvement through early adolescent problem behaviors and competencies to young adult substance abuse. Participants (N = 1203; 51.5% female; 93.8% African American) were assessed from age 3 to age 26.

Results—CPC participation initiates a pathway to increased parent involvement and expectations, which positively impact adolescents' competencies and problem behaviors, lowering rates of substance abuse.

Conclusions—Through early childhood education, increasing early parental involvement and expectations can alter life-course outcomes by providing children with a foundation for positive behaviors and encouraging adaptive functioning in adolescence.

Keywords

parent involvement; substance abuse; mechanisms of substance abuse prevention

By the twelfth grade, approximately half of American adolescents have used an illicit drug at least once.¹ Due to the detrimental impacts of substance abuse, there has been a plethora of research aimed at identifying the risk factors and causes of substance abuse, which has led to the development of multiple prevention programs with the aim of delaying and reducing substance abuse.^{2,3,4,5} This study examines an early childhood intervention program as a potential approach to reduce substance abuse in emerging adulthood.

Prevention Strategies for Substance Abuse

The National Registry of Evidence-based Programs and Practices (<http://nrepp.samhsa.gov/>) identifies 33 evidence-based childhood substance abuse prevention programs, ranging from school-based social competency programs, curriculum-based programs, community-level interventions, and home-visiting programs. While evidence-based, these programs are limited in scope and target the delayed onset or prevention of substance abuse through a single strategy (e.g. home visitation, school-curriculum). A more economically effective approach would be to fund an ecologically-oriented program that includes reducing substance abuse as one among other positive changes.

The Child-Parent Center (CPC) program is a comprehensive early childhood education (ECE) intervention program with a parent involvement focus, targeted for economically disadvantaged families. Research has documented the long-term positive outcomes for CPC participants across a variety of developmental domains.^{6,7,8,9} Although the CPC program has demonstrated increased parent involvement, and has associated these increases with student achievement,^{10,11,12} the mechanisms leading from program involvement to substance abuse are unclear. There is evidence that parent involvement is related to children's behavior problems in adolescence¹³ and that these problems then predict substance abuse in emerging adulthood.¹⁴ Little research, however, has investigated the pathways within ECE programs from parent involvement and expectations to young adult substance abuse. Furthermore, the effects of parental factors on competencies, such as frustration tolerance, and problem behaviors, have gone relatively unstudied. An ECE program that demonstrates a long-term positive impact *beyond* academics, and including young adult health, would be a financially efficient prevention strategy; evidence indicates that the benefits of ECE programs on education and crime alone can return \$7 for every \$1 invested.⁹

Competencies and Problem Behaviors and Substance Abuse

Young adult drug abuse poses a myriad of developmental risks through the increased odds of life-course persistent misuse. The likelihood of developing a substance use disorder (SUD) is considerably higher when substance abuse begins in adolescence^{15,16}; while the median-age of onset of SUD is 19–21 years¹⁷, 90% of people who qualify for a diagnosis began using substances prior to age 18. These problem behaviors are situated in a complex interacting ecological context including parent, school, and personality traits that has been recognized clinically as a premorbid feature of SUD.^{18,19,20,21,22} Frustration tolerance in particular, which has been conceptualized as a self-regulatory competency,²³ has been associated with substance abuse across a range of studies.¹⁹ For example, boys at high risk for SUD have been found to be lower in frustration tolerance than boys who were not at risk.²²

Childhood and adolescent externalizing and antisocial behaviors also consistently link with later substance abuse.^{24,25} Aggressiveness in early childhood predicts drug abuse, and becomes more predictive with increasing age.^{26,27} Furthermore, early adolescent behavior problems predisposes children to the development of SUD, even when controlling for

attentional problems.²⁶ Bryant and colleagues²⁸ examined the association between children's behaviors and later substance abuse and found school misbehavior was associated with substance abuse at age 14. Additionally children who evince behavior problems in middle childhood are more likely to have continued conduct problems later in life than children who do not²⁹. Conduct problems have also been found to be associated with SUD.^{5,24} Given their potential to lead to maladaptive behaviors, behavior problems are important to mitigate.

Parent Involvement, Competencies, and Problem Behaviors

Research indicates that early parent involvement has a sustained influence throughout children's development. While the positive impact of parent involvement and expectations on achievement has been thoroughly examined,^{30,31} far less research has examined non-academic outcomes. Especially of interest is the impact of early school parent involvement on later maladaptive behaviors (e.g. substance abuse) and its underlying mechanisms (e.g. frustration tolerance).

There is some evidence indicating that parent involvement and expectations impact domains of development beyond achievement. For example, Griffin and colleagues³² found that parent involvement was associated with less delinquent activity. Moreover, research indicates that low parent involvement is related to a host of later problems (e.g. behavior problems, attendance),^{13,26,28} which then predict adolescent substance use.¹ Relatedly, the relationship between substance use and academic achievement has also been well-documented.³³

Furthermore, low parent expectations of a child's school progress have been found to be associated with later substance abuse.^{21,28} However, the relations between parent involvement and later substance use has not been thoroughly investigated.

The Present Study

The CPC program is an ongoing center-based early intervention that provides educational and family-support services to disadvantaged children and their families.³⁴ CPC programs provide opportunities to encourage parent participation in school events and activities to facilitate a welcoming parent involvement culture. Numerous longitudinal studies have documented the success of these efforts, identifying the positive impact of CPC parent involvement on children's reading achievement and reduced rates of grade retention and special education status.³⁵

While the CPC program's impact on parent involvement has previously been examined within the framework of children's long-term academic success¹², its impact on young adults' tendency to abuse substances, and predictive mechanisms within this context, has not been examined. To extend current literature, in the present study we examine the pathways leading from CPC involvement to substance abuse. As school parent involvement involves multiple contexts of bidirectional relationships, it is critical that we examine the potential long-term pathways from early parent involvement to young adult well-being. Moreover, it is important to identify the specific mechanisms that underlie these long-term associations

so that interventions can be based on elements with proven effectiveness. We hypothesized that greater parent involvement and expectations increased through CPC participation, set in motion a pathway leading from these parenting factors to reduced early adolescent behavior problems, and higher frustration tolerance, resulting in lower rates of substance abuse in emerging adulthood.

Methods

Sample

The study sample is from the Chicago Longitudinal Study, an investigation of the effects of the CPC program.³⁵ Children who attended CPC in preschool ($n = 777$) and a matched comparison group ($n = 426$) were followed into adulthood (51.5% female). As both the CPC schools and comparison schools were located in inner-city Chicago, there was very little variation in demographic characteristics – 93.8% of the sample was African American. All descriptive statistics of independent, dependent, and covariate variables used are presented in Table 1. As a consequence of living in school neighborhoods eligible for Title I funding, all children in the study were eligible for and participated in government-funded early childhood programs. In this quasi-experimental study, groups were matched on pre-program characteristics (e.g. age, eligibility for intervention, family poverty).

Key Variables

CPC participation—CPC participants were coded as 1 (0 = comparison).

Parent involvement and expectations—Teacher ratings of parent school involvement (i.e. frequency of attendance at school events) and expectations (i.e. parent expectation for child's educational attainment) assessed every year from kindergarten through 3rd grade were used (all items were on a scale from 1 to 5). Teachers have been shown to be reliable assessors of parent school involvement and expectations.³⁶ All available data on parent involvement and expectations were standardized via z-scores. Means for parent involvement and expectations were calculated by adding all available z-scored parent involvement and expectation items and dividing by the number of time points available. Students had different teachers at each grade level; therefore, creating a mean score from K-3rd grade combines scores from a number of teachers, and minimizes potential common method bias attributable to information obtained from only one informant, and providing a more valid assessment of these constructs than relying on one information at one time point.

Competencies and Problem Behaviors—Problem behaviors and frustration tolerance, distinct areas of child functioning, were measured by the Teacher-Child Rating Scale in the 6th and 7th grades.²³ As with the earlier grades, participants had different teachers at 6th and 7th grades; a mean of the participants' scores on problem behaviors and frustration tolerance were used in analyses. Creating a mean of these two grade levels eases the potential for common method bias due to information obtained from one informant.

The problem behavior subscale is the mean of 6th and 7th grades combined total scores on acting out, shy/anxious, and problem behavior/learning problems, as recommended by the

developer of the tool²³. Teachers rated students on the following scale: 1 = “not a problem”, 3 = “moderate,” and 5 = “very serious problem;” range = 18–84; M = 36.31, SD = 14.25.

Acting out: Each year’s score is the sum of 6 items (e.g. “disruptive in class,” “fidgety,” “disturbs others while they are working,” “constantly seeks attention,” “overly aggressive to peers,” “deviant, obstinate, stubborn”; range = 6 – 30; M = 12.25, SD = 6.21). The reliability coefficient (Cronbach’s alpha) using a pair-wise comparison for grade 6 = .94 (n = 813); grade 7 = .95 (n = 718).

Shy/anxious: This scale is the sum of 6 items (e.g. withdrawn; shy, timid; range = 6 – 28; M = 9.94; SD = 3.96). The reliability coefficient (Cronbach’s alpha) using a pairwise comparison for grade 6 = .81 (n = 812); grade 7 = .79 (n = 718).

Learning/behavior problems: This scale consists of 6 items: (e.g. underachieving; poor work habits; poor concentration; range = 18 – 84; M = 36.83, SD = 14.22). The reliability coefficient (Cronbach’s alpha) using a pair-wise comparison for grade 6 = .93 (n = 813); grade 7 = .94 (n = 718).

Frustration tolerance: This scale measures a total of 5 items: (e.g. ignores teasing; tolerates frustration; range = 5 – 25; M = 14.47; SD = 4.59). The reliability coefficient (Cronbach’s alpha) using a pair-wise comparison for grade 6 = .89 (n = 813); grade 7 = .91 (n = 718).

Substance abuse—We combined self-report survey data of substance abuse collected at age 24 (e.g. Have you ever smoked marijuana, Have you ever used drugs harder than marijuana?) with an official adult drug arrest by age 26 acquired from the Illinois Department of Corrections records (Abusers=315; Non-abusers =888). Participants who received a 1 on at least one source of data received a 1 (1 = substance abuse; 0 = no abuse).

Covariates

All covariates (dichotomous, e.g. 1 = teen mom, 0 = is not teen mom; 1 = single mom, 0 = not single mom) acquired through birth records and administrative data assessed prior to participating in the study, included in the path analysis, are presented in Table 1.

Missing Data

The current study included all participants with substance abuse data (N = 1203). Amount of missing data ranged from 0% – 28.7%, with a mean of 6.39% over all variables. Analysis of missing data for the sample of participants with substance use data was conducted to determine whether missingness was related to the value of the variables under investigation (i.e., correlations or chi-square analyses were run with missingness and variables in the analyses); none of the variables were significantly associated with missingness, indicating that data were missing at random.³⁷ To allow analysis of all participants included in this sample, full information maximum likelihood estimation was used via MPlus.³⁸ For missing completely at random and missing at random data sets, this estimation has been shown to perform adequately, and has all of the strengths of multiple imputation.³⁹

Data Analysis Plan

We tested a path analysis using MPlus version 7.3³⁸ examining the process among CPC participation, school parent involvement, parent expectations, adolescent competencies and problem behaviors, and young adult substance abuse (see Figure 1). We predicted that parent involvement decreases problem behaviors and increases frustration tolerance, which in turn lowers the rate of substance abuse among young adults. We conducted a model with maximum likelihood (ML) estimator and a Monte Carlo integration; substance abuse was defined as a categorical variable. MPlus estimates a logistic regression within the path model and provides odds ratios for variables regressed on the categorical dependent variable when the estimator is specified as ML³⁸. All of the paths in the model controlled all covariates (Table 1), and within time cross-sectional construct correlations.

Results

Correlations

Zero-order correlations for key variables in the path analysis model are reported in Table 2. All key variables included in the model are significantly correlated with each other.

Path Analysis

The results of the path analysis for the full model are shown in Figure 2. Omitted from the figure are non-significant paths and paths from covariates. The model accounts for 41% of the variance in substance abuse.

Table 3 displays the path coefficients, significance levels, and the standard errors, controlling for all covariates. Significant paths from (a) CPC participation to school parent involvement ($\beta = .179, p = .000$) and parent expectations ($\beta = .096, p = .001$), (b) school parent involvement and parent expectations to behavior problems ($\beta = -.143, p = .000$; $\beta = -.160, p = .000$, respectively) and frustration tolerance ($\beta = .107, p = .006$; $\beta = .126, p = .001$, respectively), and (c) adolescent problem behaviors ($\beta = .123, p = .020$) and adolescent frustration tolerance ($\beta = -.107, p = .054$) to young adult substance use were found. Higher levels of problem behaviors increased the odds of substance abuse in emerging adulthood (OR = 1.021); so that, for every one unit increase in problem behaviors, the odds of substance abuse increased by a factor of 1.021; whereas, higher levels of frustration tolerance in adolescence lowered the odds of substance abuse in emerging adulthood (OR = .946); so that, for every one unit increase in frustration tolerance, the odds of substance abuse decreased by a factor of .946.

Additionally, the path analysis was also run with the inclusion of race as a covariate. Given that 93.8% of our participants were African American, the results remained the same.

Indirect paths—Three significant indirect pathways were identified:

1. CPC participation increased school parent involvement and parent expectations in middle childhood which both decreased problem behaviors in adolescence and lead to a decrease in the likelihood of substance abuse.

2. Increased parent involvement in middle childhood decreased problem behaviors in adolescence leading to a lower likelihood of substance abuse.
3. Increased parent expectations decreased problem behaviors in adolescence leading to less likelihood of young adult substance abuse.

Discussion

Our findings highlight the importance of CPC participation as an interventional strategy to decrease substance abuse nearly two decades later. Participation in the CPC program in early childhood initiated a pathway increasing parent involvement and expectations that then lead to increased middle childhood competencies and decreased problem behaviors, which then lowered the likelihood of substance abuse in emerging adulthood. Thus, CPC participation sets in motion a positive developmental trajectory leading to reduced substance abuse. An important mechanism whereby CPC participation is effective is increased school-age school parent involvement.

While our results provided evidence for the predictive impact of early adolescent problem behaviors on substance abuse, we also found a trending pathway from early adolescent frustration tolerance to substance abuse. Our analyses demonstrate that both problem behaviors and frustration tolerance may contribute two substantively different mechanisms in impacting substance abuse. Further investigation is needed to examine why problem behaviors had a clear, strong, association with substance abuse, while frustration tolerance had a weaker, trending association.

Although previous studies have documented the impact of school parent involvement on children's development, the present study is the first of its kind to not only illustrate the long-lasting implications of school parent involvement on children's health status but also to identify specific mechanisms (i.e. frustration tolerance, problem behaviors) of this longitudinal process. Our research provides support for examining programs with a strong focus on promoting early school parent involvement and high parent expectations as a strategy to reduce substance abuse and other health and well-being related issues later in emerging adulthood.

While there are a number of other factors that were not accounted for in the present study that may affect individuals during the transition to adulthood, Gottfredson and Hirschi's work on social control⁴⁰ provides support for our findings. The authors proposed a "General theory of crime" that pinpointed parent involvement as the origin of the process that leads to delinquent behavior. Parents who are involved in the success of their children and have high expectations for their achievement may recognize poor behaviors exhibited due to the lack of the child's self-control, and appropriately modify the children's behaviors to reflect self-control. In this way, highly involved parents with high expectations for their children's success shape and develop their children's self-control skills. Parent involvement first sets the trajectory of an individual's life course in determining delinquent behavior.

Implications

The identification of mechanisms that connect CPC program participation in preschool to substance abuse in emerging adulthood accounted for over 40% of the variance in predicting substance abuse. The influence, albeit indirect, of early childhood education on substance abuse over 15 years later demands further consideration of high-quality early childhood education programs as an alternative prevention program to reduce long-term substance abuse. Policy makers should consider further endorsement of early childhood education programs with an emphasis on parent involvement as an alternative approach to impacting maladaptive behaviors, rather than taking myopic and targeted approaches to reducing substance abuse.

Furthermore, our results suggest that increasing school parental involvement and expectations of their children's academic success starting in early childhood can alter life-course outcomes by providing children with a foundation for pro-social behaviors and encouraging adaptive functioning in adolescence and emerging adulthood.

Based on our findings, along with other studies supporting the benefits of school involvement,¹³ it is clear that schools should provide a welcoming environment for parents and encourage parents to participate in school events - particularly during early and middle childhood.

Conclusion

Our study's findings highlight the persistent impact that a high-quality early childhood education program can have on young adult substance abuse among predominantly African American populations. We have documented that early childhood education programs may have long-lasting impacts not just on academics, but also on long-term well-being. Early childhood education, combined with a strong emphasis on family engagement is important for enhancing children's long-term health and well-being, through improving their competencies and problem behaviors. Thus, our recommendations are twofold: First, we urge education and public health policymakers to begin re-conceptualizing early childhood education as a prevention program for not only academics but also for well-being. Second, within these early childhood education programs, we urge schools and administrators to welcome parents into their schools and provide families with opportunities to be involved and engaged in a partnership with their school-community.

Acknowledgments

This research was supported by the National Institute of Health (grant: R01HD034294) and United States Department of Education (grant: U411B110098). Selected sections of this study were presented at the 2014 Society for Research on Adolescence poster session in Austin, TX. All authors who have significantly contributed to the manuscript are listed.

List of acronyms used

CPC	Child-Parent Center
SUD	substance use disorder

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Implications and Contributions

We examined the Child-Parent Center (CPC) program as an alternative substance abuse prevention mechanism. Through CPC, parent involvement improves competencies and problem behaviors, influencing substance abuse. Our results support early childhood education programs as a possible strategy to mitigate adolescent substance abuse.

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Figure 1.
Hypothesized Path examining preschool intervention, parent involvement, and social competencies on substance abuse

Figure 2.

Path analysis examining preschool intervention, parent involvement, and social competencies on substance abuse

Note: All paths in the model included covariates, these are omitted from the figure for clarity purposes. Non-significant paths are omitted from the figure for clarity purposes. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1

Study variable descriptive statistics.

Variable	Intervention Status	N	M (SD)	%	Range
Parent involvement	CPC	740	.11 (.71)		-1.88–2.00
	Control	405	-.26 (.73)		-2.07–2.00
Parent expectations	CPC	701	.07 (.78)		-3.33–1.54
	Control	367	-.22 (.91)		-3.40–1.43
Problem behaviors	CPC	565	35.58 (13.95)		18–84
	Control	292	37.72 (14.73)		18–78
Frustration tolerance	CPC	565	14.74 (4.60)		5–25
	Control	292	13.95 (4.53)		5–25
Substance abuse	CPC	777	.23 (.423)		0–1
	Control	426	.31 (.47)		0–1
Covariates					
Gender (female)	CPC	777		54.3	
	Control	426		46.5	
Race (black)	CPC	777		94.0	
	Control	426		93.4	
School-neighborhood >60% poverty	CPC	777		77.2	
	Control	426		73.7	
Single parent	CPC	777		75.8	
	Control	426		75.4	
Mother < 18	CPC	777		16.5	
	Control	426		17.6	
Mother < high school ed.	CPC	777		50.1	
	Control	426		58.7	
>4 children	CPC	777		16.6	
	Control	426		19.5	
TANF participation	CPC	777		62.2	
	Control	426		61.3	
Kindergarten achievement	CPC	777	66.71 (12.68)		30–99

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Variable	Intervention Status	N	M (SD)	%	Range
	Control	426	60.27 (13.27)		19–99

Table 2

Correlation matrix for variables in path analysis model

	Problem Behavior	Frustration tolerance	Parent involvement	Parent expectations	Substance abuse
CPC Participation	-.083**	.091**	.239***	.169***	-.089**
Problem behavior	--	-.678***	-.300***	-.316***	.226***
Frustration tolerance		--	.222***	.239***	-.226***
Parent involvement			--	.525***	-.143***
Parent expectations				--	-.158***

Note:

**
 $p < .01$ ***
 $p < .001$.

Table 3

Path analysis results

Path model estimates	Unstandardized	Standardized	p-value
CPC → parent inv.	.277 (.044)	.179	.000
CPC → parent exp.	.169 (.051)	.096	.001
Parent inv. → problem behaviors 6/7	–2.766 (.715)	–.143	.000
Parent exp. → problem behaviors 6/7	–2.728 (.630)	–.160	.000
Parent inv. → frust. tolerance 6/7	.663 (.242)	.107	.006
Parent exp. → frust. tolerance 6/7	.687 (.216)	.126	.001
Beh problems 6/7 → Drug abuse	.020 (.009)	.123	.020
Frustr tolerance 6/7 → Drug abuse	–.055 (.029)	–.107	.054
Indirect Effects			
1. Overall indirect effect:			
CPC → Drug abuse	–.042 (.013)		.001
Specific indirect effect:			
CPC→parent inv. →problem behaviors 6/7→Drug abuse	–.016 (.008)		.058
CPC→parent exp. →problem behaviors 6/7→Drug abuse	–.009 (.005)		.083
2. Overall indirect effect:			
Parent inv. → Drug abuse	–.093 (.032)		.003
Specific indirect effect:			
Parent inv. →problem behaviors 6/7 → Drug abuse	–.056 (.029)		.047
3. Overall indirect effect:			
Parent exp. → Drug abuse	–.093 (.029)		.002
Specific indirect effect:			
Parent exp. → problem behaviors 6/7 → Drug abuse	–.056 (.027)		.042

Note: “6/7” denotes behaviors assessed in 6th and 7th grade. Covariates are not included in this table for clarity purposes. MPlus does not provide standardized indirect effects for Model ML.